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Vol. 1061 Number 4

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

December 24, 1985

U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 24, 1985 Volume 1061 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1061 OG 24
Notice of Maintenance Fees Payable	1061 OG 24
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1061 OG 24
Reissue Applications Filed	1061 OG 25
Requests for Reexaminations Filed	1061 OG 25
Change to the Processing Period for Trademark Registrations Issued	1061 OG 25
Errata	1061 OG 25
Patent Certificates of Correction	1061 OG 26
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1061 OG 27
Condition of Patent Applications	1061 OG 28
Reexaminations	1365
Reissue Patents Granted (32,052)	1367
Plant Patents Granted (5,606)	1369
Patents Granted	
General and Mechanical (4,559,646)	1371
Chemical (4,560,384)	1629
Electrical (4,560,826)	1755
Design Patents Granted (281,828)	1859
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 56
Classification of	
Patents (Including Reissues and Reexaminations)	PI 61
Designs and Plants	PI 64
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 65
Designs and Plants	PI 66
Change of Address Form and Subscription Order Form	Back Page

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 21, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,364,123 through 4,365,350
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.36(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, NO PATENTS EXPIRED ON OCT. 6, 1985, DUE TO FAILURE TO PAY MAINTENANCE FEES.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,382,867, Re. S.N. 781,869, Filed Sept. 30, 1985, Cl. 210/754, IN PLACE GAS CLEANING OF DIFFUSION ELEMENTS, Frank L. Schmit, et al., Owner of Record: *Water Pollution Control Corp., Milwaukee, Wis.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 136

4,406,112, Re. S.N. 781,119, Filed Sept. 26, 1985, Cl. 56/12.9, PRESSURE AIR MANIFOLD AND OUTLETS SYSTEM FOR GRAIN HEADER OR HARVESTER CUTTING PLATFORMS, Donald G. Brooks, Owner of Record: *Harvestaire Pty. Ltd., Scarborough, Western Australia,* Attorney or Agent: Harold J. Kinney, et al., Ex. Gp.: 333

4,408,442, Re. S.N. 777,941, Filed Sept. 18, 1985, Cl. 57/22, METHOD AND DEVICE FOR JOINING AN UPPER THREAD TO A LOWER THREAD, Joachim Rohner, Owner of Record: *W. Schlafhorst & Co., Monchen-Glad Bach, Germany,* Attorney or Agent: Dalbert U. Shefte, Ex. Gp.: 245

4,408,921, Re. S.N. 786,509, Filed Oct. 11, 1985, Cl. 401/198, MARKING PEN, Masahiko Nagai, Owner of Record: *Ogawa Chemical Industries, Ltd., Tokyo, Japan,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 332

4,512,618, Re. S.N. 783,985, Filed Oct. 3, 1985, Cl. 339/14R, GROUNDING MATING HARDWARE, Vijay Kumar, Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, Ex. Gp.: 322

4,527,630, Re. S.N. 782,783, Filed Oct. 2, 1985, Cl. 166/321, HYDRAULIC ACTUATING MEANS FOR SUBSURFACE SAFETY VALVE, Ronald E. Pringle, Owner of Record. *Camco, Inc., Houston, Tex.,* Attorney or Agent: William A. Stout, et al., Ex. Gp.: 356

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Change to the Processing Period for Trademark Registrations Issued

The processing period between publication for opposition and registration will be changed from 10 weeks to 12 weeks beginning with applications published for opposition on Oct. 15, 1985. Therefore, from Oct. 15, 1985 onward, trademark applicants can expect to receive a registration 12 weeks after the mark is published for opposition so long as an opposition or request for extension of time to oppose is not filed against their application.

As a result of the change from a 10-week to a 12-week processing period, few if any registrations will issue in the Dec. 24, 1985 and Dec. 31, 1985 Trademark Official Gazettes.

MARGARET M. LAURENCE,
Oct. 29, 1985. *Assistant Commissioner, for Trademarks.*

Errata

"All reference to Patent No. 4,539,619 to James D. Hill of Mt. Airy, Md. for 'HIGH ENERGY DEGAUSSER' appearing in the Official Gazette of Sept. 3, 1985 should be deleted since no patent was granted."

PATENT NOTICES

Certificates of Correction for the Week of Dec. 24, 1985

Re. 31,926	4,510,414	4,525,251	4,537,863
Re. 31,975	4,511,522	4,525,285	4,538,098
4,270,141	4,511,570	4,525,327	4,538,689
4,307,018	4,511,828	4,525,532	4,538,693
4,319,325	4,512,480	4,525,617	4,539,256
4,347,246	4,514,676	4,525,770	4,539,406
4,349,466	4,515,707	4,525,964	4,540,341
4,386,179	4,515,776	4,526,058	4,541,479
4,417,645	4,515,989	4,526,868	4,541,603
4,425,271	4,516,291	4,527,116	4,542,618
4,438,916	4,516,561	4,527,543	4,542,671
4,454,351	4,516,884	4,527,618	4,542,771
4,465,482	4,517,163	4,528,243	4,543,117
4,475,874	4,517,722	4,531,914	4,543,151
4,476,485	4,519,115	4,532,051	4,543,495
4,479,874	4,519,135	4,532,765	4,543,672
4,483,260	4,519,420	4,534,120	4,543,876
4,484,072	4,519,886	4,534,543	4,544,026
4,484,099	4,520,083	4,534,806	4,544,136
4,489,537	4,520,822	4,534,959	4,544,688
4,489,721	4,521,894	4,535,055	4,545,076
4,494,856	4,522,195	4,535,505	4,545,156
4,500,458	4,523,680	4,536,303	4,545,183
4,502,980	4,523,790	4,536,307	4,546,226
4,503,170	4,523,836	4,537,188	4,546,669
4,505,909	4,523,925	4,537,229	4,546,852
4,507,347	4,524,192	4,537,407	4,547,552
4,508,799	4,524,918	4,537,670	4,547,620
4,509,610	4,525,141	4,537,728	4,548,041
4,510,156	4,525,151	4,537,764	4,548,922

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 23, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,408,657 to 3,413,655, inclusive

Plant Patents . . . . . Numbers 2,844 to 2,846 inclusive

REEXAMINATIONS

DECEMBER 24, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,999,756 (442nd)

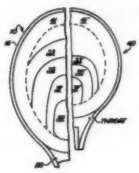
TENNIS RACKET

Howard Head, Baltimore, Md., assignor to Prince Manufacturing, Inc., Princeton, N.J.

Reexamination Request No. 90/000,676, Dec. 3, 1984.
Reexamination Certificate for Patent No. 3,999,756, issued Dec. 28, 1976, Ser. No. 612,076, Sep. 10, 1975.
Continuation-in-part of Ser. No. 516,550, Oct. 21, 1974, abandoned.

Int. Cl.[4] A63B *49/02*

U.S. Cl. 273—73 C



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–18** is confirmed.

1. A tennis racket comprising a frame having a head connected to a handle grip so as to have an overall length of 26 to 28 inches and a weight of 12 to 15 ounces, said head having a strung surface of 85 to 130 square inches, the length of said surface in a direction along the longitudinal axis of the racket being between 12 and 15 inches and between 45 and 58% of the total length of the racket, said surface having a maximum width between 9½ and 11½ inches in a direction generally perpendicular to said axis, the center of percussion of said surface being approximately adjacent the geometric center thereof, and the center of gravity of the racket being at a location between 45 and 52% of the total length of the racket as measured from the butt end of the handle grip.

REISSUES

DECEMBER 24, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,052

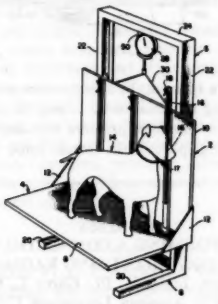
VETERINARY EXAMINATION TABLE

Alexander J. Rosenberg, Roslyn, and Philip M. Rosenberg, Churchville, both of Pa., assignors to Animal Veterinary Products, Inc., Galesburg, Ill.

Original No. 4,170,961, dated Oct. 16, 1979, Ser. No. 820,125, Jul. 29, 1977. Application for reissue Oct. 16, 1981, Ser. No. 312,003

Int. Cl.[4] A61D *3/00*

U.S. Cl. 119—103 **12 Claims**



1. An examination table for animals which comprises

a frame;

a platform movably connected to said frame and adapted to be vertically movable with respect thereto between a low position and an elevated position;

an actuator means connected to said frame and to said [horizontal] platform for causing relative vertical movement therebetween; and

a force transducer means connected to said platform and to said frame for permitting a determination to be made of the weight of an animal placed on the platform,

the said force transducer means comprising a scale and [a cable] *an elongated means to connect the platform to the scale, the elongate means being* interconnected between the scale and a portion of the platform , *the elongate means being slack when the platform is in an elevated position, the elongate means being taut when the platform is in the said low position, whereby the weight of the animal may be determined on the scale when the platform is in the low position.*

Re. 32,053

ARTICULATED RIBBON-GUIDING STRUCTURE

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Original No. 4,047,607, dated Sep. 13, 1977, Ser. No. 672,699, Apr. 1, 1976. Application for reissue Aug. 28, 1979, Ser. No. 70,457

Int. Cl.[4] B41J *32/00, 33/14*

U.S. Cl. 400—208 **34 Claims**

1. In a printing machine of the kind having a frame, and a printing carriage movable with respect to said frame along a printing path, said printing carriage comprising printing means,

the improvement comprising:

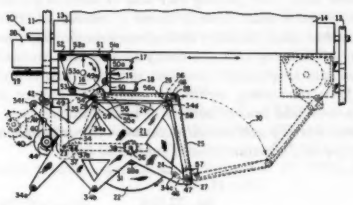
ribbon supply means carried by said frame and relatively stationary as compared to said movable printing carriage for storing a supply of ribbon, said ribbon supply means having an output,

ribbon directing means on the movable printing carriage for directing said ribbon past the printing means, said ribbon directing means having an input on said movable printing carriage, and

ribbon guiding means having one end supported adjacent said output for receiving ribbon from said supply means and another end connected to and moved by said printing carriage for supplying the ribbon to the input of said ribbon directing means,

said ribbon guiding means including means that provides a substantially constant feed length between said output of the ribbon supply means and said input of the ribbon directing means irrespective of the position of said movable printing carriage along said printing path.

34. A ribbon cartridge for use in a printing machine which machine has (a) stationary means for receiving said cartridge, (b) a carriage movable, with respect to said stationary means along a stationary writing line, and (c) a printing apparatus for performing printing and which guides printing ribbon past said apparatus to print on a record medium supported thereat, (d) said stationary means including stationary driving means which is capable of



performing a driving operation as printing proceeds and which is positioned closely adjacent said cartridge when said cartridge has been received by said stationary means,

said cartridge comprising:

ribbon take-up means for taking-up said printing ribbon, said take-up means having a ribbon input;

said cartridge including a casing, for said ribbon take-up means, configured to be received by said stationary means; and

ribbon-guide means attached to said casing and connectable to said printing apparatus to guide the ribbon from said printing apparatus to said input along a path of substantially unvarying length irrespective of the position of the printing apparatus along said writing line,

said take-up means including an element carried by said casing and which engages said driving means so as to be driven thereby when said stationary means has received said cartridge, said element when driven by said driving means applying a driving force to said take-up means, so that ribbon is pulled along said ribbon-guide to said take-up means.

Re. 32,054

ARRANGEMENT FOR CONCENTRATING SEA WAVES

Even Mehlum, Oslo, Norway, assignor to Sentralinstitutt For Industriell Forskning, Oslo, Norway

Original No. 4,255,066, dated Mar. 10, 1981, Ser. No. 942,497, Sep. 13, 1978. Application for reissue Oct. 5, 1981, Ser. No. 308,850

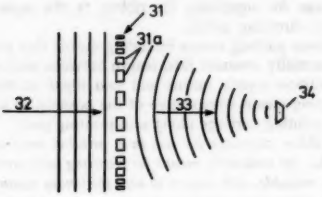
Claims priority, application Norway, Sep. 13, 1977, 773154

Int. Cl.[4] E02B *9/08*

U.S. Cl. 405—76 **8 Claims**

13. A lens system for concentrating water wave energy, said

system comprising an off-shore grid-like means for transforming substantially rectilinear incident water wave fronts into curved water wave fronts which converge toward a common focal area spaced beyond said grid-like means, said grid-like means comprising a structure extending in a longitudinal direction generally transversely of a primary direction of propagation of said incident water wave fronts, said structure comprising means for changing the phase of said incident water wave fronts by effecting a delaying action on a water wave front passing over said structure, said phase changing means comprising a plurality of delaying elements aligned in said longitudinal direction and completely submerged



at a depth such that the water waves do not break on passing over said elements, each said delaying element being shaped and positioned in said longitudinal direction such that said delaying action on a water wave front passing over said element is greater above locations of each said element nearer a central portion of said structure than above locations thereof more remote therefrom, said plurality of delaying elements being shaped and mutually positioned in said longitudinal direction such that said delaying elements form interacting means for creating a greater delaying action nearer said central portion of said structure than remote therefrom, whereby said curved water wave fronts are formed and roll beyond said structure toward said focal area.

Re. 32,055

METHOD OF OPERATION FOR AN OIL-INJECTED SCREW-COMPRESSOR

(Lars) Lauritz B. Schibbye, Saltsjö-Dufnäs, and Rolf A. Englund, Spånga, both of Sweden, assignors to Sullair Technology AB, Stockholm, Sweden

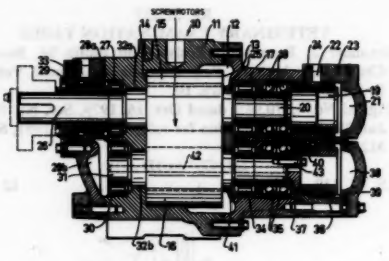
Original No. 4,462,769, dated Jul. 31, 1984, Ser. No. 326,602, Dec. 2, 1981. Application for reissue Jan. 22, 1985, Ser. No. 694,125

Claims priority, application Sweden, Dec. 12, 1980, 8008760

Int. Cl.[4] F04C *18/16, 29/02*

U.S. Cl. 418—1 **9 Claims**

1. A method at an oil-injected screw-compressor for balancing axial forces at at least one of the rotors of the compressor, for sealing the gaps between the rotor housing and the shafts of the rotors and for cooling and lubricating the bearings of the rotor shafts, where a rotor housing includes a compression space in the form of two rotor barrels defined by two intersecting bores with a low-pressure port at one end and a high-pressure port at the other end, and two meshing rotors, viz. a male rotor and a female rotor, mounted rotatably in the rotor barrels, which compressor is driven on the shaft of the male rotor on the high-pressure side, characterized in that at the high-pressure end of the compressor oil under pressure is supplied to bearing spaces at the ends of both rotors, that an oil flow inward to the compression space along the gaps between the rotor shafts and the rotor housing is obtained for sealing against leakage from the compression space, and that oil is supplied via a connection from the bearing space of the female



rotor to a pressure space at the low-pressure end of the female rotor for balancing the axial force arising on the shaft end of the female rotor on the high-pressure side due to the oil supplied to the bearing space of the female rotor.

Re. 32,056

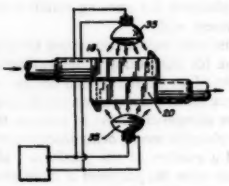
METHOD OF FORMING A CONNECTION BETWEEN TWO SEALED CONDUITS USING RADIANT ENERGY

Daniel B. Granzow, Ingleside, Ill.; Garry L. Carter, Racine, Wis., and David W. Ammann, Longmount, Colo., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 4,157,723, dated Jun. 12, 1979, Ser. No. 843,608, Oct. 19, 1977. Application for reissue Jun. 9, 1981, Ser. No. 271,907

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **54 Claims**



1. The method of forming a connection between sealed conduits, each conduit carrying an opaque, thermoplastic wall portion, which method comprises:

bringing said opaque wall portions of said conduits together into facing contact, and [exposing said opaque wall portions to sufficient] *applying sufficient electromagnetic* radiant energy to cause said opaque wall portions to fuse together and to open an aperture through said fused wall portions, providing sealed communication between the interiors of said conduits.

PLANT PATENTS

GRANTED DECEMBER 24, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,606

MINIATURE ROSE PLANT/MINNCO

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed Jan. 30, 1984, Ser. No. 576,840

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—5 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dense, much branched, prostrate (spreading) habit, substantially as illustrated and described, characterized by buds and flowers of a medium pink color, being of a shade generally near Fuchsine Pink 627/1 or lighter, the bud and flower resembling the variety Stacey Sue (U.S. Plant Pat. No. 4,158) in form and size; and further characterized by a plant of vigorous, much branched, prostrate growth habit, easy to propagate from cutting, with an abundance of flowers borne usually in clusters of 5 to 15.

5,607

ROSE PLANT-MEIKOLA VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 16, 1984, Ser. No. 571,203

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the fact that

from the physical point of view, the plant has medium green adult wood, an erect growth habit, and forms large attractive double blossoms which are light Venetian pink on the inner and outer surfaces with the outer surfaces of the petals being lightly shaded with fuchsine on the edges, and

from the biological point of view, the plant has vigorous vegetation, and produces an abundance of long lasting blossoms, substantially as shown and described.

5,608

ROSE PLANT—DOLLY PARTON VARIETY

Joseph F. Winchel, Harbor City, Calif., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Feb. 14, 1984, Ser. No. 579,980

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant, substantially as herein shown and described, characterized particularly by (a) attractive very large fully double blossoms of orange-red coloration, (b) outstanding blossom fragrance, (c) excellent blossom form, (d) strong sturdy stems, (e) exceptional vigor which forms a well-branched broad and upright plant, and (f) above average disease resistance.

5,609

PLUM TREE, "WESTERNER"

John M. Garabedian, P.O. Box 7883, Fresno, Calif. 93747

Filed Feb. 15, 1984, Ser. No. 580,196

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described which is somewhat similar to the Laroda Plum Tree (unpatented) with which it bears fruit which matures at substantially the same time but from which it is distinguished by bearing fruit of larger size, deeper and fuller external color, and a substantially greater amount of red color in its flesh.

5,610

PLUM TREE, SOUTHERNER

John M. Garabedian, 3104 E. Huntington Blvd., Fresno, Calif. 93702

Filed Feb. 15, 1984, Ser. No. 580,258

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by the blood-red flesh of its medium-sized, globular fruit and its general similarity to the Frontier Plum Tree (unpatented) which matures at substantially the same time but from which it is distinguished by its more globular fruit shape, deeper red flesh, and milder flavor.

5,611

RANUNCULUS PLANT—FEVER

Simon Tomatis, 451 Chemin St Elisabeth, 06140 Vence, France

Filed Dec. 27, 1983, Ser. No. 565,883

Claims priority, application France, Dec. 27, 1982, 82 21968

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct variety of ranunculus, as described and illustrated.

5,612

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 43

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,503

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant named Vista Impatiens No. 43, as described and illustrated, and characterized by its large red-purple flowers, with each flower having a white eye, dark green foliage, floriferous habit, dense compact habit, and its good self-branching and moderate rate of growth, making it ideal for hanging baskets, bedding plants and pot culture.

5,613

IMPATIENS PLANT NAMED VISTA IMPATIENS NO. 56

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Dec. 29, 1983, Ser. No. 566,806

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant, known by the cultivar name Vista Impatiens No. 56, as described and illustrated, and characterized by its large, vivid poppy orange colored flowers with white eyes, profuse flowering, dark green foliage, tall and upright habit, and by its moderate rate of growth and good self-branching habits, making the cultivar ideal for bedding plants and pot culture.

PATENTS

GRANTED DEC. 24, 1985

ERRATA

For CLASS	See PATENT NO.
623–003	4,559,648
229–005	4,560,063
296–095	4,560,245
514–178	4,560,557
514–379	4,560,558
204–159	4,560,709
264–104	4,560,796
363–045	4,561,081
273–157	4,561,097

PATENTS

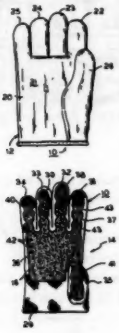
GRANTED DECEMBER 24, 1985

GENERAL AND MECHANICAL

4,559,646
WORK GLOVE

James L. Ertl, Appleton, Wis., assignor to Zwicker Knitting Mills, Appleton, Wis.

Continuation-in-part of Ser. No. 534,160, Sep. 21, 1983, abandoned. This application May 24, 1984, Ser. No. 613,446
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—16 **15 Claims**



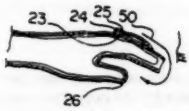
1. A work glove comprising an outer shell including portions defining a palm, a back and finger and thumb portions,

a lining disposed within said shell and having palm, finger, and thumb portions disposed adjacent the corresponding portions of said shell, and a foam pad disposed between said lining and said shell and encompassing a substantial portion of the palm and the frontal areas of the thumb and finger portions of the shell, said pad being relatively flat and having a plurality of perforations formed therein, the finger and thumb portions or said pad having areas of reduced width corresponding to the finger and thumb joints of a potential wearer thereof, said perforations being arranged in rows which extend diagonally and downwardly across the palm and from the side thereof containing the thumb.

4,559,647
CONVERTIBLE GARMENT

Rae Smith, 356 Devon St., Stratford, Ontario, Canada (N5A 2Z9), and Patricia Moratto, 4 Walford Rd., Toronto, Ontario, Canada (M8X 2P1)

Filed Sep. 10, 1984, Ser. No. 648,808
Int. Cl.[4] A41D *27/10*
U.S. Cl. 2—158 **11 Claims**



1. A convertible garment as a combination cuff and mitt comprising:

(a) a tubular fabric member having a distal and a proximate end, the distal end being formed as a collar reversingly foldable to form a cuff for embracing the wrist of a wearer;

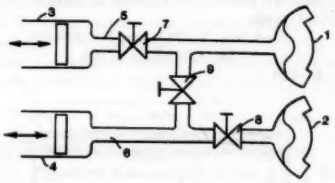
(b) a protuberance with a tip closed to prevent ingress of cold air from the exterior and positioned proximate the collar to accommodate the thumb of a wearer, the collar extending beyond the closed tip to cover the fingers of the wearer; and

(c) a flap formed as an overlaying portion on the outside of the collar for folded-over mating therewith to form an outer pocket with an open mouth positioned between the tip and the distal end of the collar and facing away from such distal end whereby to effectively close such distal end against ingress of cold air.

4,559,648
SAFETY CONTROL VALVE FOR AN ARTIFICIAL HEART

Klaus Affeld; Axel Mohnhaupt, and Frank Jorn, all of Berlin, Fed. Rep. of Germany, assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Jun. 28, 1984, Ser. No. 625,506
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323862
Int. Cl.[4] A61F *1/24*
U.S. Cl. 623—3 **7 Claims**

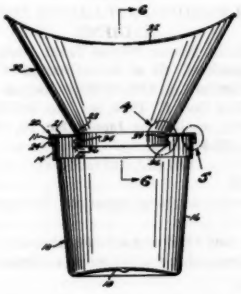


1. A safety drive for an artificial heart, comprising left and right pneumatic circulatory pumps each made of biocompatible material and each being driven by one of two mutually independent pneumatic drives, and means for switching the drive for said right pneumatic circulatory pump to serve as a backup drive for the left pneumatic circulatory pump.

4,559,649
URINE SPECIMEN COLLECTION SYSTEM

Patricia A. Burnett, Placentia, Calif., assignor to Panett Corporation, La Habra, Calif.

Filed May 24, 1983, Ser. No. 497,686
Int. Cl.[4] A47K *11/00*
U.S. Cl. 4—144.1 **11 Claims**



1. A urine specimen collecting system which comprises:

a collection cup having peripheral lip means proximate its top;

collection funnel means having first peripheral connection means thereon releaseably connectable with said lip means at a first connection with the inside of said funnel means in communication with the inside of said cup means for collection of a urine specimen through said funnel means into said cup;

a storage lid having second peripheral connection means thereon releasably connectable with said lip means at a second connection so as to cover said cup;

said funnel means comprising a funnel and a collection lid;

said funnel being connectable to said collection lid and said first connection means being on said collection lid;

the connection between said funnel and said collection lid having a smaller diameter than said peripheral lip means of said cup;

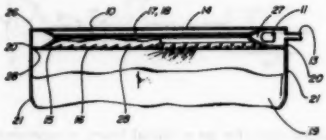
the connection between said funnel and said collection lid being more secure than said first connection, whereby said collection funnel means is adapted to be disengaged as a unit including said funnel and said collection lid from said collection cup.

4,559,650

STAINLESS STEEL TOILET

Walter Pruckner, Downsview, Canada, assignor to Waltec, Inc., Ontario, Canada

Filed Nov. 9, 1983, Ser. No. 550,129
Int. Cl.[4] E03D *11/08*
U.S. Cl. 4—420 **3 Claims**



1. In a sheet metal toilet of the type including a bowl having a sidewall with a seat affixed thereto, said seat comprising interconnected upper and lower portions defining therebetween an annular space, the periphery of said lower space having apertures to allow escape therefrom of water introduced into said space during flushing of the toilet, the improvement comprising, in combination therewith,

means for producing unidirectional peripheral water flow within said space, and

an upwardly deformed leading edge at each aperture to intercept the peripherally flowing water and direct the same obliquely down the wall of the toilet bowl.

4,559,651

HOT-WATER WASHING APPARATUS FOR PERSONAL HYGIENE

Takashi Tanahashi, Ikoma; Mitsuo Takai, Nara, and Masahito Uemura, Kashihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 17, 1984, Ser. No. 682,512
Claims priority, application Japan, Dec. 20, 1983, 58-240117; Mar. 12, 1984, 59-47453
Int. Cl.[4] A61H *35/00*
U.S. Cl. 4—443 **18 Claims**

1. A hot-water washing apparatus for personal hygiene comprising:

a hot-water tank receiving a heater therein;

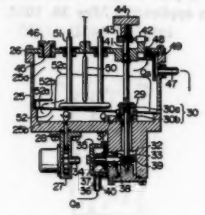
a nozzle connected to the hot water outlet of said hot-water tank;

a water supply pipe for supplying water to the water inlet of said hot-water tank;

an operating valve, a connection chamber and a pump which are provided between said water supply pipe and said water inlet in that order;

said connection chamber being provided below said hot-water tank;

a flow control valve which is connected to the bottom portion of said hot-water tank on the inlet side and connected to said connection chamber on the outlet side;



an operation shaft which is inserted into said hot-water tank from the outside thereof and to which said flow control valve is connected;

a first cam which is mounted on said operation shaft and is engaged with said operating valve; and

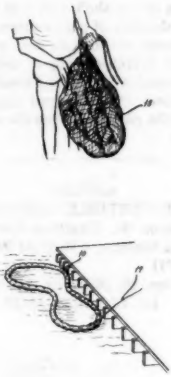
a second cam which is mounted on said operation shaft and which is connected to the start switch of said pump.

4,559,652

SELF-OPENING PORTABLE SWIMMING ENCLOSURE AND METHOD OF USING SAME

Benjamin Uchitelle, 41 Crestwood Dr., Clayton, Mo. 63105

Filed Aug. 8, 1983, Ser. No. 521,009
Int. Cl.[4] A47K *3/00*; E04H *3/18*
U.S. Cl. 4—487 **9 Claims**



1. A portable swimming enclosure having an erected operating position and a folded coiled storage position comprising:

(a) a foldable open mesh body having side walls and a bottom wall and an open top,

(b) weight means positioned at the bottom wall to locate the bottom and side walls beneath the water surface when the enclosure is in its erected position,

(c) a float system connected to and extended along the open top of the body to support the enclosure in the water with the open top of its body at the surface of the water, and

(d) self-opening resilient means connected with the mesh body at the top thereof for holding the top in an open position when it is in the water so that one may enter the

mesh body through its open top, the resilient means also being connected with the float system such that it is supported by the float system at the surface of the water, the resilient means when unrestrained assuming by reason of its resiliency a generally endless configuration that closes upon itself to enclose an area for swimming, the resilient means being capable of folding against its resiliency from the open position to a compact configuration along with the mesh body for storing and carrying.

4,559,653

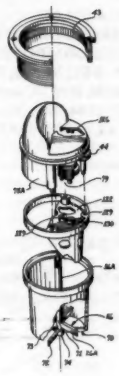
ROTATABLE HYDROTHERAPY NOZZLE

Lester R. Mathews, Phoenix, Ariz., assignor to Caretaker Systems, Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 438,978, Nov. 3, 1982, which is a continuation-in-part of Ser. No. 359,442, Mar. 18, 1982. This application Feb. 25, 1983, Ser. No. 468,174

Int. Cl.[4] E03C *1/02*; A61H *33/02*

U.S. Cl. 4—541 **6 Claims**



1. A hydrotherapeutic system including in combination:

a container for fluid having a size sufficient to permit at least partial submersion of a person therein;

a plurality of hydrotherapy heads in said container located beneath the normal fluid level thereof for supplying streams of fluid under pressure at an acute angle to the surface of the container at the location of each of said heads; and

rotating means comprising an impeller and gear train mechanism rotated by the fluid flowing through each of said heads for rotating each head independently of the others to thereby automatically, simultaneously and continuously rotate the streams of fluid issuing from said heads to create a varying pattern of fluid movement in said container.

4,559,654

BEDDING UNITS AND COMPONENTS FOR SUCH UNITS

Ned W. Mizelle, 230C N. Point Ave., High Point, N.C. 27260

Filed Sep. 14, 1983, Ser. No. 532,137

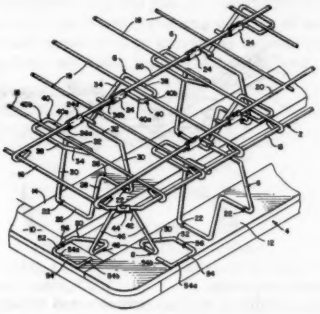
Int. Cl.[4] A47C *23/02, 23/053*

U.S. Cl. 5—255 **53 Claims**

1. A spring for supporting a wire grid on a frame of a bedding unit,

said spring being formed of a single resilient wire which has a lower portion connectible to the frame, an upper portion connectible to the wire grid, and a midportion connecting the lower portion to the upper portion, said midportion being vertically collapsible to support the upper portion resiliently on the lower portion,

said upper portion being substantially horizontal and including a longitudinally oriented center bar and a pair of transverse bars, said center bar being formed of two sections which are at opposite ends of said single resilient



wire, said center bar being spaced from and located between said transverse bars at a position where the opposite ends of the center bar are directed toward midportions of the transverse bars, said upper portion also having a pair of connecting sections each of which extends from one end of the center bar to one end of a transverse bar.

4,559,655

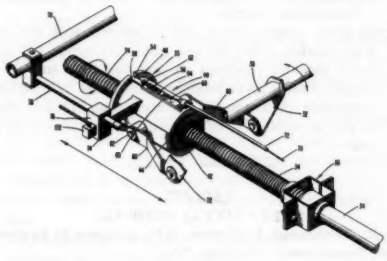
BED HAVING ARTICULATED FRAME

William Peck, Oldenburg, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed Aug. 11, 1982, Ser. No. 407,037

Int. Cl.[4] A61G *7/06*; F16H *1/18*

U.S. Cl. 5—66 **17 Claims**



1. A bed comprising:

a base,

a body support frame mounted on said base and including a movable head section for adjusting the inclination of a user's upper torso,

a motor,

connecting means operably coupling said motor to said head section of said frame for changing the inclination of said head section at a speed governed by said motor, and

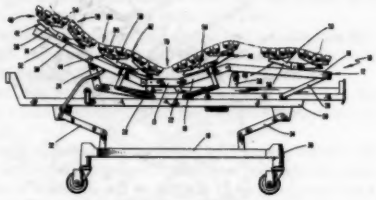
release means including a manually operated actuator member arranged inaccessibly to a user lying on the bed and movable relative to said head section in a first direction for uncoupling the drive connection between said motor and said head section to enable the latter to be moved downwardly independently of said motor, said actuator member being movable relative to said head section in a second direction for recoupling said drive connection.

4,559,656

HOSPITAL BED WITH A WEIGHT-DISTRIBUTING LEVER SYSTEM

L. Dale Foster, Brookville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.

Filed Dec. 28, 1982, Ser. No. 454,000
Int. Cl.[4] A47C *23/06*; A61G *7/06*
U.S. Cl. 5—236 R **30 Claims**



1. A bed comprising:

a frame including a head section mounted for articulation, motor-driven means for articulating said head section,

a plurality of support assemblies mounted on said frame and spaced apart in the fore-aft direction of said bed, at least one of said support assemblies being mounted on said head section, each support assembly comprising:

a plurality of elongate support elements extending transversely of said fore-aft direction and spaced apart in said fore-aft direction, and

a pair of transversely spaced lever modules carrying opposite ends of said transverse support elements by a pivotable connection, each lever module comprising:

a first lever swingable about a transversely extending first axis disposed intermediate its ends, and

a pair of second levers mounted on said first lever on opposite sides of said first axis, each of said second levers being swingable relative to said first lever about a transversely extending second axis disposed itermediate its ends;

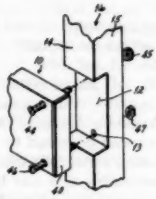
each lever module being interconnected with the other lever module solely by said pivotably connected transverse support elements so that the first and second levers of each lever module of said pair of modules is swingable relative to the corresponding first and second levers, respectively, of the other lever module of said pair.

4,559,657

SHEET METAL BEDRAIL

Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 12, 1984, Ser. No. 649,819
Int. Cl.[4] A47C *19/02*
U.S. Cl. 5—286 **3 Claims**



1. A sheet metal bedrail assembly adapted to mount within a cutout portion formed in the legs of the headboard of a bed comprising:

a sheet metal bedrail adapted for insertion within said cutout portion formed in said legs of said headboard, said legs having mounting bores formed in said cutout portion, said bedrail including a longitudinally and vertically extending web portion having top and bottom marginal edges, said web portion being formed with longitudinally extending beads at each of said top and bottom edges, said top and bottom beads each being formed with a mounting bore;

an end cap having a pair of spaced legs mounted to opposite ends of a plate and extending perpendicularly thereto, each of said legs being formed with a mounting bore;

said legs of said end cap being adapted to be inserted within said upper and lower beads of said bedrail so that said mounting bores formed in said legs align with said mounting bores formed in said beads, said plate of said end cap engaging and covering one end of said bedrail;

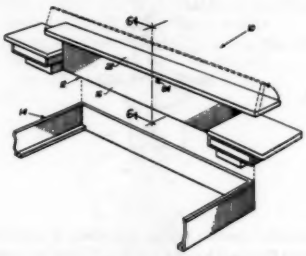
a bolt insertable through said mounting bores of each of said beads of said bedrail and said legs of said end cap with said bedrail in position within said cutout portion of said legs of said headboard, said bolts extending through said mounting bores in said cutout portion and being tightened therewithin for mounting said bedrail to said headboard.

4,559,658

POSITIONING ASSEMBLY FOR A FURNITURE PANEL OR LIKE COMPONENT

John H. Cory, 17961 N.W. 2 Pl., Miami, Fla. 33169, and Ben H. Zuckerman, 1202 Granada Blvd., Coral Gables, Fla. 33134

Filed May 7, 1984, Ser. No. 607,444
Int. Cl.[4] A47C *19/02*
U.S. Cl. 5—433 **5 Claims**



1. A positioning assembly of the type primarily designed for use in supporting and positioning a furniture panel or like structure, said positioning assembly comprising:

(a) lift means including at least one slide element having an elongated configuration an including free end disposed in movable, driving engagement with a furniture panel,

(b) a drive assembly including a motor means drivingly interconnected to said one slide element and structured for selective reverse directional movement of said slide element along its own longitudinal axis,

(c) a cable and pulley assembly movably disposed in driving interconnection between said motor means and said one slide element and structured for reciprical movement of said one slide element upon operation of said motor means in opposite directions,

(d) said cable and pulley assembly comprising at least a first and a second cable segment each drivingly attached to said motor means and interconnected to said one slide element and further including at least a first and a second pulley element connected to said first and said second cable segment respectively intermediate said motor mean and said one slide element,

(e) said first pulley element and said first cable segment and said second pulley element and said second cable segment respectively disposed on opposite sides of said motor means and further disposed for concurrent movement in opposite directions upon activation of said motor means,

(f) said cable and pulley assembly further comprising a drive pulley element secured in direct driving attachment to said motor means and drivingly interconnecting said first cable segment thereto for concurrent and successive travel in opposite directions upon rotation of said motor means in opposite directions,

(g) said third pulley element rotatably secured to said slide element in spaced relation to said free end, said third pulley element connected to both said first and said second cable segments for successive rotation in opposite directions upon rotation of said motor means in opposite directions,

(h) switch means disposed adjacent a path of travel of said one slide element and in interruptive relation to said one slide element,

(i) said switch means including at least a first and a second switch element disposed and structured for interruptive engagement with said slide element at spaced apart locations from one another and said respective switch elements further disposed and structured to limit the extent of travel of said one slide element in opposite directions,

(j) a safety means for regulating operation of said motor means when lifting of the furniture is prevented, said safety means comprising a trip element secured to at least one of said cable segments so as to move therewith and an auxiliary switch assembly disposed in interruptive disposition relative to a path of travel of said trip element as it moves with said one cable segment,

(k) said safety means further comprising said auxiliary limit switch electrically interconnected to said motor means so as to regulate current flow thereto, and a spring element attached to said one cable segment and disposed and structured for extension movement of said trip element into engagement with said auxiliary switch assembly when movement of said one slide element is prevented, said latter engagement causing a stopping of current flow to said motor means,

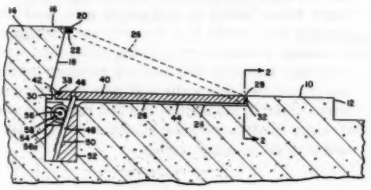
(l) whereby positioning of the furniture panel is automatically operated and operation of said motor means is stopped upon prevention of opening of said panel.

4,559,659

POWER OPERATED WHEELCHAIR RAMP

Kelvin H. Hunter, Jr., Fairfax, Va., assignor to Paralyzed Veterans of America, Washington, D.C.

Filed Jan. 31, 1984, Ser. No. 575,674
Int. Cl.[4] E01D 1/00
U.S. Cl. 14—71.3 **10 Claims**



1. A pivotable ramp to permit a wheeled vehicle to travel between a lower level and an upper level separated by at least one step, said ramp comprising:

(a) a generally rectangular plate having pivot means at a first end thereof to define a pivot axis, said plate having an upwardly facing surface and an upwardly extending lip at a second end thereof spaced from and opposite to said first end, and an upwardly opened groove in the upwardly facing surface of said plate rearwardly of said lip at said second end and adjacent said lip;

(b) retainer means positioned on said lower level to rotatably retain said pivot means;

(c) grooved lip receiving means positioned adjacent the upper edge of a step for receiving said lip of said rectangular plate; and

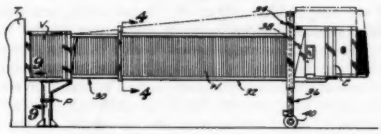
(d) means to elevate said plate about said pivot axis between a first position below said step and parallel to said lower level, and a second position wherein said plate is inclined relative to said first position and said second end is adjacent to said upper level, said lip engaging with said lip receiving means when said plate is in said second position, said lip receiving means preventing pivoting of said plate beyond said upper level to provide an inclined ramp extending from said lower level to said upper level.

4,559,660

AIRCRAFT LOADING RAMP

Robert D. Lichti, Lakewood, Calif., assignor to Yusaf Tarkan, Huntington Beach, Calif.

Filed Nov. 14, 1983, Ser. No. 551,015
Int. Cl.[4] E01D 1/00
U.S. Cl. 14—71.5 **16 Claims**



16. An aircraft loading ramp apparatus for transferring passengers and cargo between a terminal and an aircraft located in a loading area:

a vertical column located adjacent said loading area and including an upper column portion elevatable relative to the lower column portion;

an elevatable walkway for projecting from the terminal to terminate in a front end disposed adjacent said vertical column, said front end being elevatable through a predetermined arc;

means for connecting said walkway with said terminal to allow for raising and lowering of said front end;

a cab rigidly mounted from said column and disposed in a substantially horizontal orientation;

means on said column for raisiing and lowering of said column;

first horizontal pivot means coupling said front end of said walkway with said cab;

an elongated rocker rigid arm extending in a generally vertical direction and formed with upper and lower extremities;

second pivot means mounting the medial portion of said rocker arm from said upper column portion;

third pivot means pivotally connecting said upper extremity of said rocker arm with the upper portion of said front of said walkway;

upwardly and forwardly extending guide means on the lower portion of said column;

a follower mounted on said lower extremity and engaged in sliding relationship with said guide means; and

said rocker arm, first, second and third pivot means and guide means being configured and arranged for sliding of said follower along said guide means as said upper column is raised and lowered to cooperate together in maintaining said column substantially vertical irrespective of the vertical positioning of said front of said walkway.

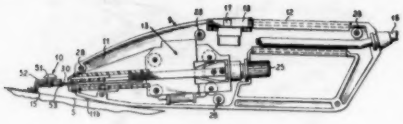
4,559,661
PAINT SCRAPER

Izrail Tsals, Princeton Junction, N.J.; Gerald E. Peterson, St. Paul, Minn.; Rudy R. Karliner, Minnetonka, Minn.; Scott R. Carpenter, Arden Hills, Minn., and Peter L. Frank, Corcoran, Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 522,975, Aug. 15, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,378

Int. Cl.[4] B44D *3/16*

U.S. Cl. 15—93 R **39 Claims**



1. A manually operable power unit for paint scraping and the like comprising a casing having a handle to enable portable use by an operator, an electro-magnetic motor mounted within the casing including a C-shaped stator and an armature coaxially mounted relative to said C-shaped stator, a bladeholder connected to said armature reciprocally movable in unison together, means for mounting the bladeholder generally coaxially of the longitudinal axis of the reciprocating armature to provide contemporaneous colinear movement of the bladeholder and the armature to substantially eliminate bending forces on the bladeholder imposed by the electromagnetic drive forces of the motor, the motor being operable on energization to move the armature and the bladeholder from a starting position to an extended position, and spring means connected to the bladeholder which is compressed when the bladeholder is moved to its extended position and said spring means operating to move the bladeholder to its starting position upon release of the electromagnetic forces generated by the motor.

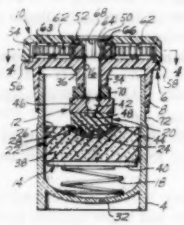
4,559,662
DEVICE FOR CLEANING CONTACT LENS

Robert Kunold, Jr., 3394 Point White Dr., Bainbridge Island, Wash. 98110

Filed May 14, 1984, Ser. No. 610,098

Int. Cl.[4] G02C *13/00*

U.S. Cl. 15—104.94 **22 Claims**



1. A device for cleaning contact lens comprising a pair of manually operated clamping means which open and close in relation to one another substantially along an axis extending therebetween, said clamping means having a pair of relatively rotatable scrubber elements thereon that are cooperatively engagable with one another at the relatively forward ends thereof when the clamping means are closed, yieldable biasing means operatively interposed between the clamping means so that when the clamping means are closed, the ends of the scrubber elements engage one another against the bias thereof, said scrubber elements having complementary convex and concave surfaces on the respective ends thereof, and said surfaces being adapted to mate with the opposing sides of a contact lens and clamp the lens lightly therebetween when the scrubber elements engage one another, means interconnecting the clamping means in the closed position thereof so that they resist relative rotation about the axis, means fixing the end of one scrubber element to the corresponding clamping means so that said end of the one element cannot rotate about the axis when the lens is clamped between the surfaces of the ends, means including a shaft rotatably mounted in the other clamping means at an axially fixed location thereon to position the end of the other scrubber element in rotatable engagement with the lens when the lens is clamped between the surfaces of the ends, means connected with the shaft whereby the end of the other scrubber element can be rotated against the lens from a point relatively outside of the clamping means, and frictional differentiation means on the end of the one scrubber element whereby the surface thereof clings to the lens and prevents the lens from rotating while the end of the other scrubber element is rotated in relation to the lens.

4,559,663
WINDSHIELD WIPER-ARM ASSEMBLY

Kurt Bauer, Ingersheim; Reinhard Edele, Bietigheim-Bissingen; Anton Epple, Rottenburg; Hans Trube, Herrenberg; Martin Pfeiffer, Stuttgart, and Josef Berger, Wolfschlugen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietgheim-Bissingen and Daimler-Benz, Stuttgart, both of, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,383

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331311

Int. Cl.[4] B60S *1/34*

U.S. Cl. 15—250.35 **20 Claims**

1. A wiper arm assembly comprising:

a wiper arm having a fastening part, a link part swivelably linked to said fastening part, said link part including two side walls and a back connecting said two side walls;

a contact pressure spring carried in said link part and acting on said link and said fastening parts; and

a wiper blade linked to said wiper arm, said wiper blade lying at least partly in a line with said link part;

said contact pressure spring being positioned such that the clearance between said contact pressure spring and the one of said two side walls is greater than the width of said wiper blade in the area of the link part; and wherein

said wiper blade is swivelable into said link part alongside said contact pressure spring.

4,559,664
AUTOMATIC WASHING- AND RINSING DEVICE FOR TITRATION PLATES OR THE LIKE

Eike Böhme, and Peter Rubenzer, both of Salzburg, Austria, assignors to Prolic AG, Zug, Switzerland

PCT No. PCT/AT82/00025, § 371 Date Apr. 29, 1983, § 102(e) Date Apr. 29, 1983, PCT Pub. No. WO83/00819, PCT Pub. Date Mar. 17, 1983

PCT Filed Aug. 30, 1982, Ser. No. 493,136

Int. Cl.[4] B67C *1/06*

U.S. Cl. 15—302 **9 Claims**

1. An apparatus for washing and rinsing a titration plate or the like having a plurality of cavities, said apparatus comprising:

a treatment station including means for supporting and re-

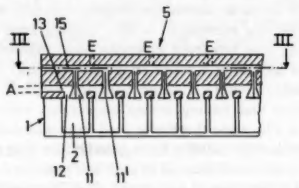
taining in a predetermined orientation a titration plate to be washed and rinsed;

a washing plate having a lower surface and positioned above said supporting means;

means for supplying a titration plate to be washed and rinsed to said supporting means at said treatment station below said washing plate, with the cavities in the titration plate directed upwardly;

means for bringing said lower surface of said washing plate and an upper surface of the titration plate into sealing contact and thereby for sealing the cavities from each other;

said washing plate having at said lower surface thereof a plurality of nozzles equal in number to the number of



cavities in the titration plate, such that when said washing plate and the titration plate are in sealing contact each said nozzle is directed into a respective cavity;

said washing plate having formed therein a plurality of bores, each said bore surrounding a respective said nozzle, thereby defining an annular gap between the exterior of each said nozzle and the wall of the respective said bore;

said washing plate having formed therein at least one discharge channel connected with said annular gaps; and

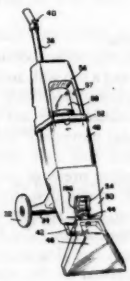
means for selectively alternately supplying liquid or gas under pressure through said washing plate and each of said nozzles into the respective cavities and then driving the liquid or gas under pressure through said annular gaps and said discharge channel, thereby selectively cleaning, rinsing or drying the cavities.

4,559,665

INDICATOR NOZZLE FOR CLEANING DEVICES

Edwin Fitzwater, Rahway, N.J., assignor to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,556
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—339 **19 Claims**



14. A cleaning device comprising:

a nozzle having inlet and outlet passages;

a conduit connected to said outlet passage;

suction means communicating with said nozzle through said conduit for removing fluid from a surface through said nozzle's passages in the flow direction from said inlet to said outlet passage;

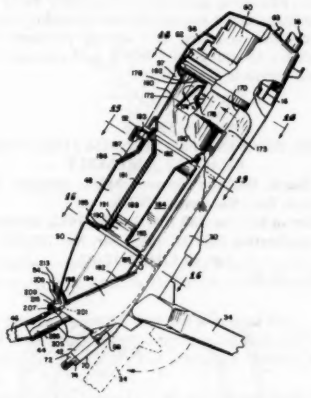
said outlet passage having a substantially horizontal, transparent top wall portion and a back wall which diverge in said flow direction while remaining sufficiently close to maintain said removed fluid adjacent said top wall to permit viewing of said removed fluid by an operator during operation of said cleaning device.

4,559,666

AIR-LIQUID SEPARATOR FOR CLEANING DEVICES

L. Scot Duncan, Independence; Hugh F. Groth, Richfield, both of Ohio, and Peter A. Basile, East Windsor, N.J., assignors to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,873
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—353 **4 Claims**



1. A cleaning device comprising:

a suction nozzle;

suction means for removing fluid from a surface to be cleaned through said suction nozzle;

separating means between said suction nozzle and said suction means for separating liquid and gas from said removed fluid, outputting said gas to said suction means, and retaining said liquid; and

said separating means having a cylindrical housing, a fluid inlet to said housing, a gas outlet displaced from said fluid inlet, a vertically downwardly increasing diameter conical shroud in said housing extending substantially to the top thereof, said fluid inlet being at the level of the top exterior of said shroud into the large end of a vertically upwardly increasing area extending from the top of said housing between said shroud and said housing, which area directs said fluid downwardly while increasing the velocity thereof, and said gas outlet being interiorly of said shroud and extending upwardly through the top of said housing into communication with said suction means.

4,559,667

DRIPLESS NOZZLE FOR A CLEANING DEVICE

Edwin Fitzwater, Rahway, N.J., assignor to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,549
Int. Cl.[4] A47L *9/02*
U.S. Cl. 15—415 R **11 Claims**

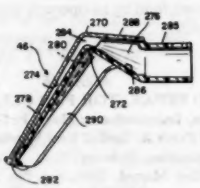
1. A cleaning device for removing liquid from a surface to be cleaned comprising:

a suction nozzle;

suction means for removing fluid from the surface through said suction nozzle;

an upright conduit connecting said suction nozzle and said suction means;

said suction nozzle including a first passage extending downwardly to said surface and a second passage having a first portion extending generally horizontally away from said first passage and a second portion extending upwardly to said conduit said first and second portions defining a trough for retaining fluid left in said conduit when said suction means is deactivated.



4,559,668

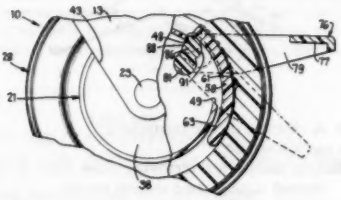
WHEEL BRAKING MECHANISM FOR A WHEEL BRACKET ASSEMBLY

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 430,166, Sep. 30, 1982, abandoned. This application Feb. 13, 1985, Ser. No. 701,443

Int. Cl.[4] B60B *33/02*

U.S. Cl. 16—35 R **16 Claims**



1. A wheel braking apparatus, comprising:

a bracket which includes spaced first and second flanges;

an axle which extends between and has its ends fixedly supported on said flanges;

a wheel rotatably supported on a bearing means on said axle between said flanges, said wheel having means defining a tread on a periphery thereof and having means defining a generally annular and radially inwardly facing first braking surface concentric with said axle and located radially between said axle and said tread;

an end cap which is disposed between said wheel and said first flange of said bracket and includes a generally circular wall which is concentric with and extends radially of said axle, which has a central opening through which said axle extends, and which has a recess in an outwardly facing surface thereof which has a shape substantially congruent with that of a portion of said first flange of said bracket supporting said axle, said first flange being disposed in said recess to prevent rotation of said end cap about said axle relative to said bracket; said end cap further including an annular flange projecting axially toward said wheel from peripheral edges of said circular wall, said circular wall and said annular flange thereby defining a shield for shielding said bearing means from dust, threads and the like, means defining an opening in said annular flange, and an elongate, arcuate, resiliently flexible brake shoe extending along said first braking surface adjacent thereto and having one end fixedly supported on said annular flange in the region of one end of said opening therein; said braking shoe having thereon a generally radially outwardly facing second braking surface which is adjacent and faces said first braking surface on said wheel, being normally in a retracted position in which said second braking surface is substantially free of engagement with said first braking surface, and being movable through generally radially outward flexing from said retracted position to a braking position in which said second braking surface is firmly engaging said first braking surface so as to prevent relative rotation of said wheel and bracket about said axle, said resilient of said brake shoe continuously urging said brake shoe toward said retracted position thereof; wherein said circular wall, annular flange and braking shoe are all integral parts of said end cap; and

manually actuable means cooperable with said braking shoe for effecting movement of said braking shoe between its braking and retracted positions, said manually actuable means including a lever supported on said end cap for movement within a range bounded by first and second positions and having means cooperable with said brake shoe at a location thereon spaced from said one end of said brake shoe for radially flexing said brake shoe as said lever moves from said second to said first position to effect said radial movement of said brake shoe from its retracted to its braking position, said end cap and said circular wall and said annular flange thereon, as well as said lever, all being oriented between said first and second flanges.

4,559,669

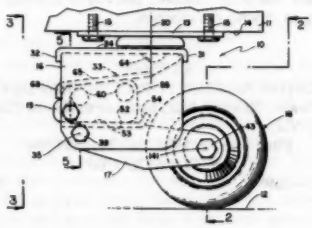
SHOCK RESISTANT CASTER HAVING PRESSURE PLATES AND CENTERING PROJECTIONS

Richard C. Bonzer, and Frederick C. Greene, both of Long Beach, Calif., assignors to Darnell Corporation, Ltd., Downey, Calif.

Filed Jun. 7, 1984, Ser. No. 618,345

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—44 **11 Claims**



1. A caster comprising:

a first structure adapted to be connected to a unit to be supported and having a top wall and two spaced side walls projecting downwardly therefrom;

a second structure connected to said side walls of said first structure for pivotal movement relative thereto about a generally horizontal first axis, and having a generally horizontally extending pressure plate portion spaced beneath said top wall of said first structure;

a wheel connected to said second structure for rotation relative thereto about a generally horizontal second axis which is offset from said first axis in a direction acting, when a load is imposed on the wheel, to cause relative pivotal movement of said structures about said first axis with downward movement of said first structure relative to said wheel;

a cushion formed of elastomeric material positioned beneath said top wall of said first structure and above said pressure plate portion of said second structure and adapted to be

pressed downwardly against said pressure plate portion of said second structure; and

an additional element interposed vertically between said top wall of said first structure and said cushion and having a pressure plate portion engageable with the upper side of said cushion and acting to compress and resiliently deform the cushion vertically between said pressure plate portions of said second structure and said additional element when a load is imposed on the wheel;

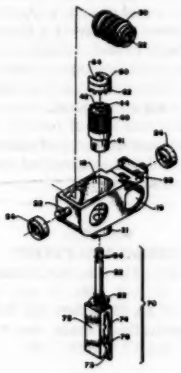
said additional element having two side walls which project upwardly from opposite edges of said pressure plate portion of said additional element at inner sides of said two side walls of said first structure and which have upper extremities bearing upwardly against said top wall of said first structure in a relation maintaining said pressure plate portion of said additional element spaced beneath said top wall of said first structure and applying force downwardly from said top wall of said first structure through said side walls of said additional element to compress said cushion between the two pressure plate portions upon imposition of a load on the wheel.

4,559,670

ADJUSTABLE CARRIER ASSEMBLY FOR A VERTICAL LOUVER WITH SPACER LINK

James L. Wyatt, 2753 W. Temple St., Los Angeles, Calif. 90026

Filed Nov. 10, 1983, Ser. No. 551,663
Int. Cl.⁴ E05D *13/02*
U.S. Cl. 16—87.2 **5 Claims**



1. Carrier for vertical louver, comprising:

frame means adapted to slide horizontally along a splined pinion rod;

worm means rotatably mounted on said frame means and having a central bore through which the pinion rod is adapted to pass;

a gear rotatably mounted on said frame means having a vertical axial bore, a plurality of tooth spaces and mating with said worm means;

vertical shaft means passing rotatably through said gear bore;

securing means on the lower portion of said shaft means for holding a vertical louver;

a separate disk secured to said shaft means above said gear, having at least one tooth projection downward and selectively engageable with at least one of the tooth spaces of said gear;

said shaft means being vertically slidable within said bore;

whereby said shaft means and said disc are adjusted relative to the carrier and the gear by moving said shaft means upwardly in a vertical direction to disengage said at least one tooth from said at least one of the tooth spaces, then rotating the shaft means and said disc relative to the gear, and then vertically moving said shaft means downwardly to selectively engage said at least one tooth with another one of the tooth spaces;

said disk comprises a split washer comprising a ring having a radial passage;

said shaft means having secant flats grooved therein on opposite sides of said shaft means, spaced axially inward from the end of said shaft means;

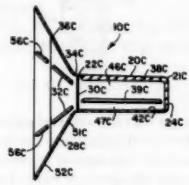
said washer being positioned around said shaft means, with said flats engaging the sides of said radial passage.

4,559,671

STERILE HANDLE COVER FOR SURGICAL LAMP

Winston A. Andrews, Clearwater, and Larry Carpenter, St. Petersburg, both of Fla., assignors to Medical Research Associates Ltd. #2, Clearwater, Fla.

Filed May 2, 1984, Ser. No. 606,237
Int. Cl.⁴ B25G *1/02*
U.S. Cl. 16—111 R **6 Claims**



1. A handle protector for covering a lamp handle of a surgical lamp to provide a sterile surface for an operator, comprising:

a grip portion having a first and a second end;

an end wall integrally attached to said first end of said grip portion to form a hollow container open at said second end;

protector means connected to said second end of said grip portion and extending radially outwardly for protecting the hand of the operator from contacting portions of the lamp proximate the lamp handle;

said protector means including a first and a second protector;

said first protector having a proximal end and a distal end with said proximal end being connected to said grip portion by a first reduced integral wall thickness;

said second protector being connected to said distal end of said first protector;

said second protector being connected to said distal end of said first protector by a second integral reduced wall thickness connector means; and

a plurality of rib means disposed longitudinally in said grip portion by a first reduced integral wall thickness for frictionally engaging the lamp handle of the lamp.

4,559,672

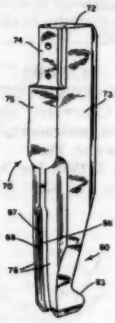
POULTRY CUT-UP MACHINE

Jacobus E. Hazenbroek, Burg de. Zeeuwstraat 52, Numansdorp, Netherlands, and William L. Wallbridge, Romsey, Hants, England

Continuation-in-part of Ser. No. 529,153, Sep. 2, 1983. This application May 7, 1984, Ser. No. 607,417
Int. Cl.⁴ A22C *21/06*
U.S. Cl. 17—11 **1 Claim**

1. In a poultry processing machine for cutting apart a previously eviscerated bird, the improvement therein comprising a mandrel for insertion into the previously eviscerated abdominal cavity of a bird, said mandrel comprising a body of elongated, generally rounded exterior shape and including a mounting end at one end portion for attaching the mandrel

body to a support member, a slot formed centrally through the distal end portion of said body which is opposite to said mounting end, said slot extending along the length of said body and dividing the distal end portion of said body into a pair of similar mandrel elements separated by the slot, said mandrel elements together defining a recess extending across said slot that intersects one side of said slot, whereby the pair of mandrel



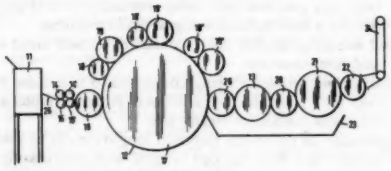
elements are inserted into the visceral cavity of a bird with the backbone of the bird protruding into the slot and the backbone is retained by the slot from lateral movement about the mandrel and the bird and mandrel are moved about cutting blades that pass adjacent the recess of the mandrel elements to cut away portions of the carcass and the slot of the mandrel is moved about a cutting blade to cut the carcass along the backbone.

4,559,673

METHOD AND APPARATUS FOR SEPARATING A NONWOVEN STUFFING MATERIAL

Claus Mölders, Friesenheim, Fed. Rep. of Germany, assignor to Badenia GmbH Stepeedeckenfabrik, Friesenheim 4, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,699
Int. Cl.[4] D01G *11/00, 15/04*
U.S. Cl. 19—82 **10 Claims**



1. The method of separating a nonwoven stuffing material from a fabric covering material to which it is adhered comprising the steps of:

(a) comminuting said adhered materials into small pieces by a cutting machine;

(b) transferring said comminuted pieces from said cutting machine into a carding device adapted to mechanically detach said nonwoven stuffing material from said fabric covering material pieces;

(c) passing said detached comminuted materials from said carding device to a centrifuging device wherein said nonwoven stuffing material is retained on brush rollers and said fabric covering material pieces are thrown off by centrifugal force; and

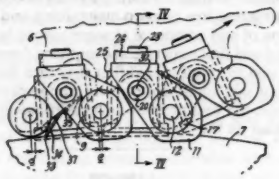
(d) removing said nonwoven stuffing material from said brush rollers by suction means for reuse.

4,559,674

MOVABLE FLAT FOR A CARDING ENGINE AND A SUPPORT ASSEMBLY THEREFOR

Michael J. Rimmer, 15 Heath Ave., Halifax, West Yorkshire, and John M. J. Varga, Royd Lodge, 2 Lawrence Rd., Skircoat Green, Halifax, West Yorkshire, HX3 OLH, both of England

Continuation-in-part of Ser. No. 378,639, May 17, 1982, abandoned. This application May 7, 1984, Ser. No. 607,770
Claims priority, application United Kingdom, May 16, 1981, 8115076; Feb. 23, 1982, 8205241
Int. Cl.[4] D01G *15/08*
U.S. Cl. 19—102 **13 Claims**



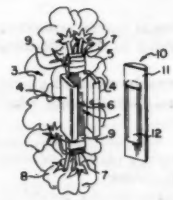
1. A movable flat assembly for a carding engine, the assembly comprising a chain at each side of the carding engine and a plurality of flat bars extending between the chains, in which each chain comprises a plurality of connected units, each unit comprising coupling means for connection to the next adjacent unit, a carrier, connecting means for detachably connecting one end of a flat bar to said carrier, a support wheel rotatably mounted on said carrier and having a circular periphery for engagement with a bend of said carding machine, said support wheel having an axis of rotation that is parallel to the longitudinal mid-plane of said flat bar, and said support wheel and said connecting means being so disposed that when a flat bar is connected to said unit said axis of rotation is parallel to said longitudinal mid-plane and the perpendicular distance between said axis of rotation and said longitudinal mid-plane is no less than half the width of said flat bar.

4,559,675

CORSAGE SUPPORT

Kirk Devenny, P.O. Box 111, Munster, Ontario, Canada (K0A 3P0)

Filed Dec. 15, 1983, Ser. No. 561,735
Claims priority, application Canada, Jan. 6, 1983, 418989
Int. Cl.[4] A45F *5/08*
U.S. Cl. 24—5 **14 Claims**



1. A support for fastening a decorative object to an article of clothing comprising: a U-shaped channel member including a pair of legs having a small degree of resilience extending from a body joining the legs, the free ends of the legs being turned in toward each other, a plate fixed to and covering a face of the body opposite the legs, the plate having smoothed edges, a snap member comprising a back having a width greater than the space between the free ends of the legs, a protrusion from one face of the back having a bulbous profile in section, the width of the protrusion spaced from the face being slightly greater than the space between the free ends of the legs, the

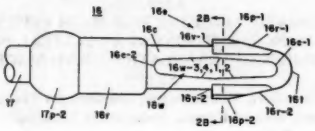
width of the protrusion adjacent the face being approximately the same as the space between the free ends of the legs, and the height of the protrusion being less than the height of the legs, the protrusion being adapted to be snapped between the legs of the channel opposite to the body with the material of said article of clothing retained therebetween and without penetrating the material of the clothing.

4,559,676

FILAMENT FASTENER WITH LOCKING HEAD

Joseph R. Paradis, Holden, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 25, 1981, Ser. No. 325,073
Int. Cl.⁴ B65D *63/10*
U.S. Cl. 24—16 PB **15 Claims**



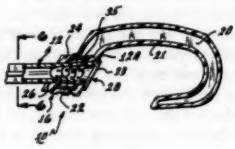
1. A fastener comprising
an elongated member having a free end with an aperture therein, said aperture extending along the axis of elongation of said member and being surrounded by a wall of said free end which has a single minimum thickness position intermediate the opposite ends of said aperture;
an elongated housing connected to the other end of said elongated member and receiving the free end therein; and means in said housing for receiving and compressing said end at the minimum wall thickness position of said aperture in order to lock said elongated member to said housing;
whereby the inclusion of said minimum wall thickness facilitates the compression of said free end and its entry into engagement with the locking means in said housing.

4,559,677

STRETCHABLE TIE-DOWN DEVICE

Richard J. Tracy, 1002 Forest Dr., Elgin, Ill. 60120

Filed May 31, 1984, Ser. No. 615,862
Int. Cl.⁴ B65D *63/00*
U.S. Cl. 24—300 **17 Claims**



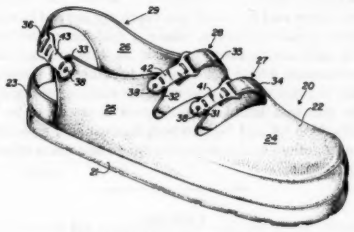
1. A stretchable tie-down device, comprising:
an elongated resilient stretchable tube composed of thermoplastic material, said tube having first and second ends, said tube being thin walled and pliable to collapse and flatten readily when passed against a surface for gripping it frictionally and snugly;
at least one hook member fixed to one of said ends;
plug means disposed within said one of said ends for fixing said hook member to said tube, wherein said hook member includes a hood portion having a sleeve portion for receiving the end of said tube, and said plug means is insertable through the forward end of said sleeve portion, wherein said sleeve portion includes a tapered bore converging from front to rear to fix securely the end of the tube therein for tending to prevent it from backing out of said sleeve portion, wherein said plug means includes an elongated plug having an outer cross-sectional configuration extending throughout its axial length in a shape complementarily relative to the cross-sectional configuration of the inside surface of the tube, said sleeve portion being molded and integrally connected to and extending from the rear end portion of said hook portion; said sleeve portion having a pair of front and rear unobstructed openings; said front opening being dimensioned to receive the rear end of said plug means; said rear opening being dimensioned to receive an end portion of the tube; said tube being internally dimensioned to receive the rear end of said plug means to compress said end portion of said tube against the inside surface of said sleeve portion.

4,559,678

FASTENING STRAPS AND ARTICLES EMPLOYING FASTENING STRAPS

Karl Birkenstock, Lohfelder Str. 40, 5340 Bad Honnef, Rhein, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,283
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306396
Int. Cl.⁴ F16L *33/12*
U.S. Cl. 24—323 **23 Claims**



1. A fastener for use with a leather or leather-like article having a pair of panels with at least one fastening anchor portion and one strap portion extending toward each other but short of actual contact, said fastening anchor portion having an anchor stud, said strap portion having a series of punch holes extending therethrough, said fastener comprising
a flexible bridging strap-like member bridging across between said fastening anchor portion and said strap portion,
said bridging member having at one end a stud-receiving portion for coaction with said stud, including an opening for entry and securement of a said stud,
the other end having a buckle portion for encompassing and sliding along said strap and having a fixed peg projecting therefrom for entering and engaging any one of said punch holes, so as to adjust for size according to which punch hole is so engaged, and
a bridging strip joining said stud receiving portion to said buckle portion.

4,559,679

HELMUT STRAP FASTENER

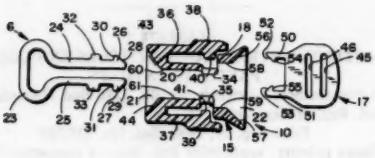
Philip L. Downey, 244 Mercury Cir., Pomona, Calif. 91768

Filed Jan. 18, 1984, Ser. No. 571,733
Int. Cl.⁴ A44B *11/25*
U.S. Cl. 24—615 **8 Claims**

1. A helmet strap fastener comprising:
a unitary molded body member defining an enclosure having end openings at two opposite longitudinal ends, a pair of transverse openings on opposite sides, and transversely deflectable latch release means operable externally from

said enclosure and including inwardly directed lugs longitudinally aligned with said transverse openings,

a spring steel fork having a loop for direct securement to a load bearing member anchored to one side of a helmet and a pair of resilient legs for insertion into one of said end openings of said enclosure, each leg defining a transversely turned foot having a bearing ledge at the leg extremity, and a transversely outwardly projecting knee between said loop and said bearing ledge, wherein said knees of said legs project into said transverse openings in said body member and longitudinally immobilize said fork relative to said body member unless said feet are brought together by deflection of said legs transversely toward each other, and



a steel catch for securement directly to a load bearing member anchored to another side of said helmet, said catch including means to transversely deflect and engage said feet when said fork and said catch are moved toward each other in said enclosure, whereby said feet of said fork legs and said catch form parts of an interengageable latch mechanism which are coupled together by insertion into said end openings at said opposite ends of said body member and said latch release means is operable by inward deflection of said lugs to bear against said knees to resiliently deflect said legs, to disengage said parts of said latch mechanism.

4,559,680

TENSIONING MACHINE

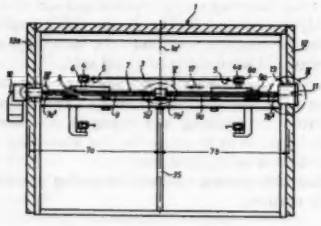
Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co., Leonberg, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,400

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 8306640[U]

Int. Cl.[4] D06C *3/02*

U.S. Cl. 26—74 **14 Claims**



1. In a tensioning machine for tensioning widthwise a length of fabric material continuously moved lengthwise along a path leading to and through at least one treatment zone, said machine having a pair of spaced apart, continuously movable members fitted with means for holding opposite sides of the material and tensioning the latter, said movable members being supported by guides that are relatively adjustable transversely of said path by means of a rotatable spindle connected to at least one of said guides, said spindle having two sections coupled together for conjoint rotation and relative axial movement, drive means connected to one of said spindle sections for driving the latter to effect relative movement of said guides transversely of said path, and control means coupled to the other of said spindle sections, the improvement wherein said control means comprises electrical force sensitive cell means operable to sense a change in widthwise tension of said material, said control means having two parts, one of said parts being connected to said other of said spindle sections for axial movement therewith and the second of said parts being fixed against axial movement, said cell means being responsive to relative axial movement of said first and second parts for generating an electrical signal, and means electrically coupling said cell means to said drive means to operate the latter.

4,559,681

AUTOMATIC MACHINE FOR HIGH EFFICIENCY MACHININGS, EMBODYING A CYCLICAL PROCESS OF COMBINED TRANSLATIONS AND MACHINING STEPS

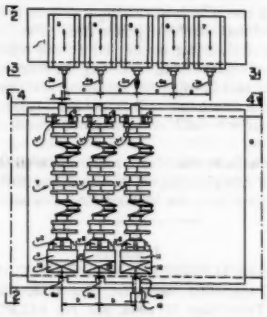
Michel Coquillart, Saint.Etienne, and Georges Yeretzian, Saint Chamond, both of France, assignors to Manufacture de Vilebrequins, France

Filed Jul. 25, 1983, Ser. No. 516,981

Claims priority, application France, Jul. 27, 1982, 82 13442

Int. Cl.[4] B23B *35/00, 39/24*

U.S. Cl. 29—26 A **9 Claims**

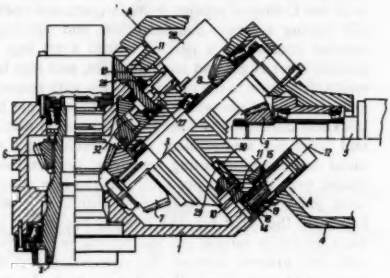


1. Automatic, heavy-duty machining machine characterized in that said machine comprises a support means (1) on which a plurality single-spindle work units (3, 4, 5, 6, 7) are permanently mounted each spindle is provided with an axis and the units are so mounted that the axes between the spindles are separated by very precise identical intervals (a), the number of work units is odd and equal to twice that of the machining operations to be performed less one, as such there is a central work unit (5) which is the only one to perform the last machining operations, the other adjoining units (3, 4, 6 and 7) on both sides of the central unit perform the other machining operations on the piece in an alternating manner, said machine also comprises a table means (8) mounted and equipped with means so as to be movable in translation in accordance with a sequential order predetermined in relation to the single-spindle work units, devices or means for positioning the pieces to be manufactured, whose number corresponds to the number of operations to be performed on the pieces and whose intervals (b) between the axes of these positioning devices are precise and equal to each other as well as to the intervals between the axes of the spindles of the work units, and holding means (14) for successively putting in place the pieces to be machined and for successively removing them after they have been machined, whereby the holding means operate to this end on pieces adjacent to the central unit (5), which performs the last machining operation.

4,559,682
MACHINE TOOL WITH SWIVELING HEAD

Michel Sachot, Saclay, France, assignor to Centre d'Etudes du Fraisage, France

Filed Jun. 16, 1982, Ser. No. 389,074
Claims priority, application France, Jun. 17, 1981, 81 11914
Int. Cl.⁴ B23Q *17/00*; B23C *9/00*
U.S. Cl. 29—26 A 24 Claims



1. In a machine tool of the type having a spindle-carrying head which swivels on a support about an axis of rotation, the combination for achieving precise rotational orientation of said head, comprising:

a planar bearing surface on the head having at least one pair of diametrically opposed head bores;

a planar bearing surface on the support having a pair of diametrically opposed bores with diameters and center-to-center separations identical to those of each of the pairs of head bores;

means for rotatably coupling the head and support for relative rotation so that the head bearing surface slides against the support bearing surface during rotation and is rotatable thereon and being centered therein with a predetermined clearance;

an expandable ring member dedicated to each support bore, each ring having an expanded state and a contracted state, the exterior diameter of said ring being at least equal to the internal diameter of the respective bore in the expanded state and being less than said internal diameter in the contracted state; and

means for mounting each of said ring members for translational movement within and between the respective support bore and a head bore aligned therewith, said ring members being contracted during said movement and being expanded while within aligned support and head bores to compensate for said clearance and locate said head with respect to said support within the limits of said clearance.

4,559,683
BLIND TACKS FOR UPHOLSTERED FURNITURE

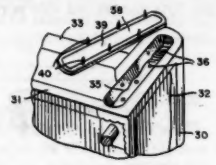
Kenneth L. Webb, Jr., Montoursville, Pa., assignor to Schnadig Corporation, Chicago, Ill.

Filed Dec. 21, 1981, Ser. No. 332,474
Int. Cl.⁴ B25H *1/04*
U.S. Cl. 29—91.1 4 Claims

1. A method of attaching finishing panels to upholstered furniture comprising the steps of:

drivably attaching a plurality of tacks to a panel having a pair of generally flat surfaces so that the tacks extend away from one of the surfaces;

subsequently covering the other surface of the panel with fabric; and

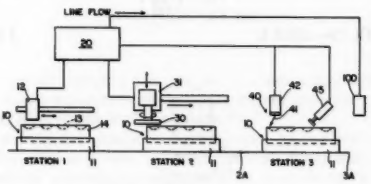


nailing the tacks into a piece of upholstered furniture so that the fabric-covered surface of the panel faces outwardly from the furniture.

4,559,684
CONTROLLED MACHINING OF COMBUSTION CHAMBERS, GEARS AND OTHER SURFACES

Timothy R. Pryor, 2775 Kew Dr., Windsor, Ontario N8S 3B7, Canada

Continuation of Ser. No. 238,702, Feb. 27, 1981, abandoned.
This application Dec. 12, 1983, Ser. No. 560,259
Int. Cl.⁴ B23P *13/00, 15/00*
U.S. Cl. 29—156.4 R 7 Claims



1. A method for controlling the volume of the chambers in a cylinder head of an engine in an in-line manufacturing process, said method comprising:

electro-optically measuring, in line, the location of a plurality of points in the cylinder chamber as referenced to the face of the cylinder head, for each of the cylinder chambers of the cylinder head of the engine;

transmitting, in electrical form, the results produced by the electro-optical measuring step for each cylinder chamber, to computing means;

computing, using the computing means, the approximate volume of each chamber from said point locations;

comparing, using said computing means, the computed volumes of the cylinder chambers; and

selectively removing material from portions of the cylinder head defining the cylinder chambers, in line, as required in accordance with said comparing step, so that all of said cylinder chambers have the same nominal volume.

4,559,685
METHOD OF MANUFACTURING A PISTON FOR INTERNAL COMBUSTION ENGINES

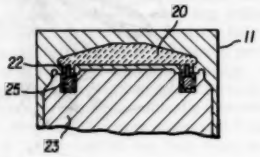
Sohichi Hara, Chiryu, and Minori Matsuzaki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 3, 1984, Ser. No. 627,528
Claims priority, application Japan, Jul. 5, 1983, 58-122553
Int. Cl.⁴ B23P *15/10*
U.S. Cl. 29—156.5 R 5 Claims

1. A method of manufacturing a piston for internal combustion engines so as to form a hollow chamber in a piston head of the piston for the passage of cooling oil, which comprises:

preparing a core so as to have at least a first and second foot portion extending therefrom;

inserting a bar member made of magnetic materials within each of said first and second foot portions;



positioning at least one permanent magnet on a core box; and

fixing said core to said core box via said bar members due to the magnetic flux of said permanent magnet.

4,559,686

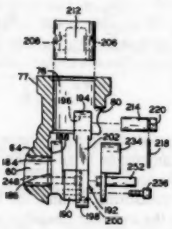
METHOD OF ASSEMBLING A HERMETIC COMPRESSOR

Donald L. Kessler, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 565,524, Dec. 28, 1983, abandoned, which is a continuation of Ser. No. 395,477, Jul. 6, 1982, abandoned, which is a division of Ser. No. 158,574, Jun. 11, 1980, Pat. No. 4,406,590. This application Jun. 19, 1985, Ser. No. 747,371

Int. Cl.⁴ B23P *15/10*

U.S. Cl. 29—156.5 R **3 Claims**



1. A method of assemblying a piston and connecting rod in a compressor comprising a crankcase having a cylinder therein including a sidewall, and a crankshaft rotatably connected to the crankcase, the piston having a skirt with an inner sidewall, said method comprising:

providing a slot in the cylinder sidewall, the slot being open in a direction generally facing the crankshaft and dimensioned to receive a first closed loop end of the connecting rod,

with the crankshaft in substantially its final and bottom dead center position, inserting said first closed loop end of the connecting rod through said slot into the cylinder and simultaneously slipping a second closed loop end of said connecting rod over a free end of the crankshaft such that the second closed loop end is journaled on the crankshaft in final position,

thereafter inserting the piston through a cylinder bore of said cylinder and over the first closed loop end of the connecting rod, there being one only narrow gap between a first surface of the first closed loop end and the piston skirt inner sidewall, the second surface of the first closed loop end being closely adjacent the piston skirt inner sidewall,

inserting a cylindrical wrist pin through the cylinder slot and then through a first opening in the piston, through the first closed loop end of the connecting rod and into an aligned second opening in the piston so as to connect the piston and connecting rod together, the wrist pin having a circumferential groove therin and being completely encircled by the piston openings and connecting rod first closed loop end, the wrist pin being in registry with the cylinder slot when the connecting rod and crankshaft are substantially in their bottom dead center; and

retaining the wrist pin in position after insertion thereof with one only C-shaped retainer by inserting the retainer into the one only narrow gap between a first surface of the connecting rod first end and the piston skirt inner sidewall, the C-shaped retainer being arcuate and open ended and having a larger diameter than said openings, said retainer comprising a pair of spaced apart legs having arcuate inner edges and tapered edges, said legs having a width dimension in the radial direction with respect to the axis of the wrist pin which is substantially larger than the thickness dimension of said legs in the axial direction of said wrist pin, said retainer further including a resilient distal end interconnecting said legs, the retainer being placed over the wrist pin such that the legs straddle the wrist pin and are in engagement with said groove and locked to the wrist pin, the retainer occupying substantially the entire narrow gap and having an interference fit with said groove between the connecting rod end and piston skirt inner sidewall to thereby lock the wrist pin against axial movement and retain the wrist pin within the piston, the second surface of said connecting rod first end being closely adjacent said piston skirt inner sidewall.

4,559,687

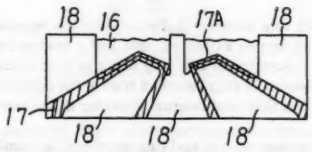
METHOD OF MANUFACTURING A COMBUSTOR NOZZLE

Makato Tsunoi; Toshio Kai; Daisaku Shozen; Tatsuo Morimoto; Ikuo Inoue, all of Hiroshima; Katsuo Jindo, and Tetsuya Sato, both of Yokkaichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,833

Int. Cl.⁴ B21D *53/00*

U.S. Cl. 29—157 C **5 Claims**



1. A method of manufacturing a combustor nozzle, which comprises preparing a mold from a material forming a nozzle body, casting an alloy forming a covering layer into said mold, and machining the resulting combination of said material and said alloy into a predetermined nozzle shape in which said covering layer covers the nose of said nozzle body.

4,559,688

BONDING EPDM GASKETS TO FILLED NYLON HEAT EXCHANGER PARTS

Ismat A. Abu-Isa, Rochester; Chen-Shih Wang, Sterling Heights, both of Mich.; Daniel P. McCarthy, Lockport, and David W. Patterson, E. Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1983, Ser. No. 544,558

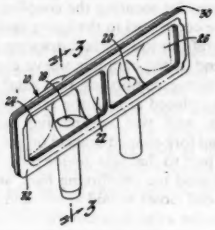
Int. Cl.⁴ B23P *15/26*

U.S. Cl. 29—157.3 R **3 Claims**

1. A method of assembling a heat exchanger having a tube header mechanically attached to a molded nylon tank with a thermoset ethylene-propylene elastomer sealing gasket sandwiched therebetween, comprising

applying an uncured thermosetting ethylene-propylene-diene elastomer composition on a nylon tank in the config-

uration of said gasket, said composition containing dicumyl peroxide and N,N'-m-phenylene dimaleimide as curing agents,



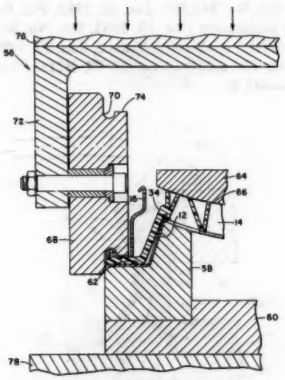
heating the composition to cure it and form a cured elastomeric gasket adhering to said tank, and thereafter locating the tank against the header with the gasket in sealing position and attaching the tank to the header.

4,559,689

WHEEL COVER MANUFACTURING APPARATUS

Lawrence C. Ladouceur, Windsor, Canada, assignor to Randall Wheel Trim, Inc., Cincinnati, Ohio

Filed Mar. 11, 1983, Ser. No. 474,375
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—243.52 **2 Claims**



1. An apparatus for forming a lightweight wheel cover comprised of a laminate structure including an outer ornamental member, a plastic insert and a retaining means provided with a plurality of jagged edge barbs, which apparatus comprises:

(a) upper and lower support means;

(b) an annular riser mounted on the lower support means for supporting the wheel cover and including an upper surface complementing the outwardly facing surface of the outer peripheral region of the wheel cover;

(c) a plurality of curling rolls mounted on the upper support means, each curling roll being positioned radially outwardly of and above the wheel cover support means for capturing the plastic insert between the outer ornamental member and the retaining means, each curling roll including:

i. a first outwardly disposed surface configured for roll curling outer ornamental member and the retaining means inwardly, and

ii. a second inwardly disposed surface configured for applying pressure onto the retaining means to cause the jagged edge barbs to penetrate and embed within the plastic insert; and

(d) the upper surface of the annular riser being configured to complement and be substantially entirely engaged by the outwardly facing surface of the outer peripheral region of the wheel cover.

4,559,690

PICTURE HANGING TOOL

Stewart Asmus, 135 N.W. 99 Way, Coral Springs, Fla. 33065

Filed Jul. 21, 1983, Ser. No. 515,849
Int. Cl.[4] B25B *33/00*
U.S. Cl. 29—270 **5 Claims**

1. A picture hanging tool for use in conjunction with, a picture frame, a picture hook, a driving means, and a driveable member, wherein the tool comprises:

A generally flat elongated rigid member having a curved hook portion formed on one end and dimensioned to partially encompass a portion of a users hand; a slot formed on one of the elongated sides of said rigid member proximate to, but spaced from, the other end, wherein said slot is dimensioned to receive said driveable member; and, a picture hook receiving arm projecting outwardly from said rigid member wherein a portion of said picture hook receiving arm is disposed parallel and adjacent to, but spaced from said slot, for the purpose of supporting said picture hook and said driveable member such that the driving means can drive the driveable member through said slot.

4,559,691

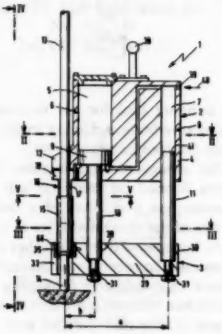
DEVICE FOR SECURING A SLEEVE ON THE ABUTTING ENDS OF REINFORCING BARS

Alto Mannhart, Munich, and Georg Rieger, Germering, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 356,332, Mar. 9, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,740
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109687
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—283.5 **11 Claims**

1. Device for coupling the abutting ends of a pair of axially aligned reinforcing bars as used in reinforced concrete structures, such as reinforcing bars having deformed outside surface, utilizing a coupling sleeve for joining the reinforcing bars together by pressing and plastically deforming the coupling sleeve around the abutting ends of the reinforcing bars, comprising an upper device part, a lower device part aligned below said upper device part, an annular drawing die having a central axis, and an inside diameter and an outside diameter encircling said central axis, said drawing die is supported on said lower device part and is arranged to be displaced in the direction of

the central axis toward said upper device part along the full axial length of the coupling sleeve for tightly securing the coupling sleeve onto the reinforcing bars, cylinder-piston means eccentrically connected to said upper and lower device parts relative to the central axis of said drawing die for moving said lower device part relative to and toward said upper device part and displacing said drawing die over the coupling sleeve, the central axis of said drawing die being alignable with the axes of the reinforcing bars to be coupled, said cylinder-piston means comprising at least one drawing cylinder-piston unit spaced laterally from and in generally parallel relation with the central axis of said drawing die, said drawing cylinder-piston unit comprising a drawing cylinder located in said upper device part and a drawing piston having one end movably displaceably located within said drawing cylinder and the other end secured to said lower device part, and counteracting cylinder-piston unit spaced laterally from and in generally parallel relation with the central axis of said drawing die and the axis of said drawing cylinder-piston unit, said counteracting cylinder-piston unit is located on the same side of the drawing die as said drawing cylinder-piston unit, said counteracting cylinder-piston unit comprising a counteracting cylinder-piston unit comprising a counteracting cylinder located within said upper device part and a counteracting piston having one end movably displaceably located within said counteracting cylinder and the other end secured to said lower device part, and means for supplying a pressurizing medium to said drawing cylinder



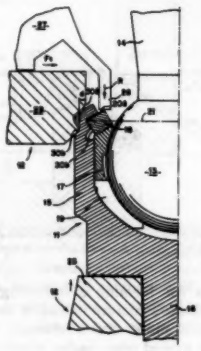
and counteracting cylinders with said means supplying the pressurizing medium into said cylinders in opposite directions relative to the axial direction of said cylinders, means arranged to bear against the end of the coupling sleeve closer to said upper device part for securing the coupling sleeve against the axial displacement toward said upper device part as said drawing die is displaced axially over the sleeve toward said upper device part, said upper and lower device parts transverse of the axial direction of said drawing cylinder and counteracting cylinder each has a forward end closer to the axis of said drawing die and a rearward end more remote from the axis of said drawing die, a fork-shaped bracket secured to the forward end of said upper device part and said bracket arranged to provide support relative to the coupling sleeve as said drawing die moves over the coupling sleeve toward said bracket, said forward end of said lower device part and the forward end of said upper device part formed by said fork-shaped bracket each having an opening extending through the forward end thereof with the opening being at least large enough to receive the reinforcing bars to be coupled whereby said device for coupling can be placed laterally onto the reinforcing bars prior to coupling the reinforcing bars together, said forward end of said lower device part inwardly of and in communication with the opening therein has an annularly shaped recess therein for receiving said drawing die, said drawing die comprising at least separate first and second die parts extending circumferentially relative to the central axis, of said drawing die and combining to form said annular drawing die, said first and second die parts being insertable into said recess in the direction extending downwardly from said upper device part toward said lower device part so that said first and second die parts completely laterally enclose one of the reinforcing bars to be coupled, said means for securing the coupling sleeve comprises a support sleeve connected to the lower end of said bracket and extending therefrom toward said drawing die and arranged to bear on the end of the coupling sleeve closer to said bracket, said support sleeve comprising two axially coextensive parts arranged to be placed around the reinforcing bars to be coupled together, said two coextensive parts being movably mounted at said fork-shaped bracket on the forward end of said upper device part so that said device for coupling can be laterally placed around the reinforcing bars, and said drawing die having a first end closer to said upper device part and a second end spaced in the axial direction of said drawing die further from said upper device part, said drawing die from said first end thereof for a substantial part of the axial direction toward said second end has an inside diameter greater than the outside diameter of said support sleeve, said two coextensive parts having a length such that the two coextensive parts can enter said substantial part of the drawing die axial direction so that said drawing die can move telescopically over said two coextensive parts of the support sleeve in deforming the coupling sleeve.

4,559,692

METHOD AND APPARATUS FOR THE MANUFACTURE OF A BALL JOINT

Gérard Morin, Conde Sainte Libiaire, France, assignor to Societe Anonyme D.B.A., Paris, France

Division of Ser. No. 342,297, Jan. 25, 1982, Pat. No. 4,504,166.
This application Dec. 15, 1983, Ser. No. 561,755
Claims priority, application France, Jan. 23, 1981, 81 01259
Int. Cl.[4] B23P *11/00, 19/04;* **B21D** *53/10*
U.S. Cl. 29—441 R **8 Claims**



1. A method of manufacturing a ball joint having a metal socket and comprising a tubular end wall portion having a longitudinal axis, a spherical pivot accommodated within said socket, a resilient grip bearing bush interposed between said socket and pivot and having an annular end portion, and a locking ring having a peripheral outer radial edge with converging outer surfaces and fixed in said socket in contact engagement with said annular end portion of said bush to retain the bush in the socket with a preload force, the method comprising the steps of:

exerting on said bush a predetermined preload force directed parallel to said axis, and

exerting, on at least one crimping location of said end wall portion, two radially inwardly directed deformation forces onto two associated axially spaced-apart portions of said end wall portion so that said outer radial edge is

surrounded by radially inwardly deformed material of said end wall portion and the deformed material engaging the converging outer surfaces.

5. A machine for carrying out the method of claim 1, which comprises:

a support for supporting said metal socket,

a tubular stop positioned along side said longitudinal axis and adapted for bearing engagement with said locking ring positioned on said annular end portion of said bearing bush accommodated in said socket, said support and said stop displaceable one relative to the other in a direction parallel to said longitudinal axis, and at least one tool adjacent said stop and displaceable perpendicularly relative to said axis and having two axially offset and radially protruding die portions.

4,559,693

PROCESS FOR FABRICATING FIELD EFFECT TRANSISTORS

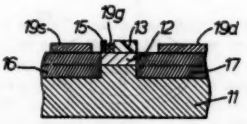
Kiyoho Kamei, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 7, 1984, Ser. No. 638,570

Claims priority, application Japan, Sep. 27, 1983, 58-176898

Int. Cl.⁴ H01L *21/265, 29/80*

U.S. Cl. 29—571 **3 Claims**



1. A process for fabricating field effect transistors comprising the steps of:

forming a first thin film on an active region of a semiconductor substrate;

coating an end face of said first film with a second thin film forming a second end face;

coating said second end face of said second film with a third thin film forming a third end face, the thin films thus conjoined, said first and third films having a different etching characteristics from that of said second film;

implanting ions into said active region to form a high carrier concentration region by using said conjoined films as a mask;

forming a source electrode on said high carrier concentration region;

forming a drain electrode on said active region spaced from said conjoined films and on the opposite side thereof from said source electrode; and

forming a gate electrode as a Schottky barrier on a surface of said active region exposed by removing said second thin film from between said first and third thin films.

4,559,694

METHOD OF MANUFACTURING A REFERENCE VOLTAGE GENERATOR DEVICE

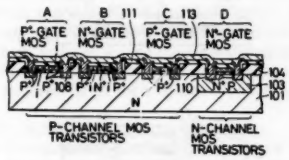
Kanji Yoh, Kokubunji; Osamu Yamashiro, Omiya, and Satoshi Meguro, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 10,961, Feb. 9, 1979, abandoned. This application Apr. 12, 1983, Ser. No. 484,351

Claims priority, application Japan, Sep. 13, 1978, 53-111717; Sep. 13, 1978, 53-111719; Sep. 13, 1978, 53-111720

Int. Cl.⁴ H01L *21/64*

U.S. Cl. 29—571 **9 Claims**



1. A method of manufacturing a semiconductor device with at least a pair of insulated gate field-effect transistors having semiconductor gate electrodes of different conductivity type, comprising the steps of:

forming an insulating film over a major surface of a semiconductor substrate at a first portion thereof and at a second portion thereof, said first and second portions being of a first conductivity type and being formed in a same part of the semiconductor substrate extending to the major surface thereof, and forming a semiconductor layer over said insulating film overlying said first and second portions;

introducing an impurity of the first conductivity type into a first portion of said semiconductor layer overlain at said first portion except for into another portion of said semiconductor layer overlain at said second portion, to provide an impurity level of said impurity of the first conductivity type at that portion;

removing said semiconductor layer to form first and second semiconductor gate electrodes at said first and second portions respectively; and

selectively introducing an impurity of a second conductivity type opposite to the first conductivity type into said first and second portions not covered with said first and second semiconductor gate electrodes and into said first and second semiconductor gate electrodes so as to provide at those portions an impurity level of the second conductivity type lower than said impurity level of the impurity of the first conductivity type at said first semiconductor gate electrode, thereby to form source and drain semiconductor regions of the second conductivity type on opposite sides of each of said first and second gate electrodes and thereby to define the second semiconductor gate electrode as of the second conductivity type without converting said first semiconductor gate electrode from the first conductivity type to the second conductivity type.

4,559,695

METHOD OF MANUFACTURING AN INFRARED RADIATION IMAGING DEVICE

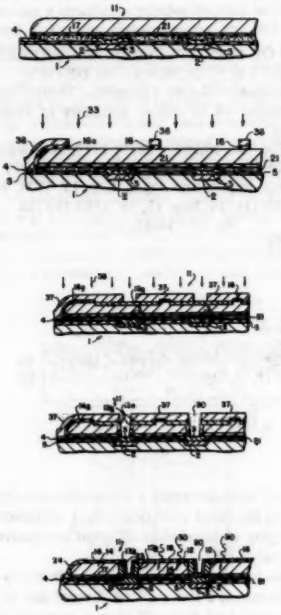
Ian M. Baker, Romsey, England, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 355,835, Mar. 8, 1982. This application Jan. 17, 1985, Ser. No. 692,258

Claims priority, application United Kingdom, Mar. 27, 1981, 8109778; Feb. 12, 1982, 8204158

Int. Cl.⁴ H01L *31/18*

U.S. Cl. 29—572 **6 Claims**



1. A method of manufacturing an infrared radiation imaging device, said method comprising the steps of:

providing a body of infrared-sensitive material having first and second opposite surfaces, said body having p-type conductivity at the operating temperature of the device; and

ion etching the body to form apertures having side walls extending from the first surface to the second surface of the body, and to convert the p-type material adjacent to the etched side walls into material having n-type conductivity at the operating temperature of the device.

4,559,696

ION IMPLANTATION TO INCREASE EMITTER ENERGY GAP IN BIPOLAR TRANSISTORS

Kranti Anand, Sunnyvale, and Robert J. Strain, San Jose, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jul. 11, 1984, Ser. No. 629,576

Int. Cl.⁴ H01L *21/265, 29/161, 21/72*

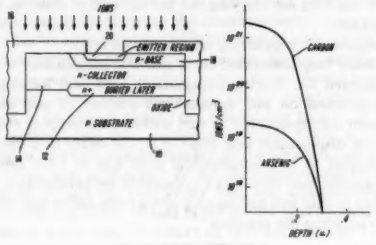
U.S. Cl. 29—576 B **10 Claims**

1. A method of improving the emitter efficiency of a bipolar transistor, comprising the steps of:

doping a silicon substrate with an impurity of one conductivity to form a base region for a transistor;

implanting an impurity of opposite conductivity in a portion of said base region to form an emitter region; and

implanting ions of a material having an energy gap which is greater than the energy gap of silicon in said emitter



region, thereby to provide the emitter region with an energy gap which is greater than that of the base region.

4,559,697

METHOD OF FIXING INSERTION ELECTRODE PANEL IN COMPRESSION-BONDED SEMICONDUCTOR DEVICE

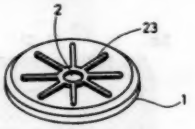
Masaaki Sadamori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,314

Claims priority, application Japan, Feb. 23, 1984, 59-34531

Int. Cl.⁴ H01L *21/60*

U.S. Cl. 29—590 **6 Claims**



1. A method of fixing an insertion electrode panel in a compression-bonded semiconductor device wherein an insertion electrode panel having a pattern hole is overlapped on a semiconductor element having an electrode pattern on its surface, with said pattern hole, being identically formed to said electrode pattern for receiving the same, aligned with said electrode pattern and the outer circumferential portion of said insertion electrode panel is fixed to said semiconductor element by attaching thereto a passivation rubber member, said method comprising the steps of:

forming on said electrode pattern of said semiconductor element an aligning pattern member of an insulating material formed identically to said electrode pattern to be attached thereto in a projecting manner from said surface of said semiconductor element; and

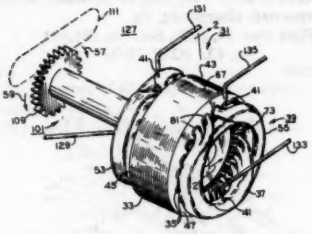
overlapping said insertion electrode panel on said semiconductor element with said pattern hole fitted with said aligning pattern member.

4,559,698

METHOD OF TREATING A LOOSE WOUND CORE, METHOD OF FABRICATING A LOOSE WOUND CORE, AND METHOD OF OPERATING APPARATUS

Eugene C. Bair, and Delmar E. Crawford, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 21, 1983, Ser. No. 563,766
The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.
Int. Cl.[4] H02K *15/12*
U.S. Cl. 29—598 70 Claims



1. A method of treating a loose wound core with a hardenable liquid adhesive material adapted for bonding the loose wound core into a generally unitary mass, the loose wound core including a lamination stack having a plurality of interfacing lamination surfaces defined between a pair of opposite end faces on the lamination stack, a bore extending through the lamination stack and intersecting with the opposite end faces thereof, and a plurality of slot means intersecting with the bore, the interfacing lamination surfaces and the opposite end faces of the lamination stack for receiving winding means of the loose wound core, respectively, the winding means having a plurality of sets of coils, and each coil having at least one conductor turn with opposite side turn portions of the coils received in the slot means and with opposite end turn portions of the coils arranged in generally annular groupings about the bore adjacent the opposite end faces, respectively, the method comprising the steps of:

preheating the loose wound core to at least a preselected temperature;

rotating the loose wound core in one direction at a speed generally between a preselected low value and a preselected high value;

feeding the liquid adhesive material onto the opposite end turn portions of the coils generally at a preselected rate of flow to at least minimize dripping of the liquid adhesive material from the opposite end turn portions of the coil when the rotational speed of the loose wound core is generally about the preselected low value thereof and to at least minimize centrifugal displacement of the liquid adhesive material from the opposite end turn portions of the coil when the rotational speed of the loose core is generally about the preselected high value thereof;

retaining in the opposite end turn portions of the coils a part of the liquid adhesive material fed thereto during the feeding step and flowing another part of the liquid adhesive material from the opposite end turn portions of the coils generally along the opposite side turn portions of the coils into the slot means of the lamination stack in which the opposite side turn portions of the coils are received thereby to at least in part fill the slot means in which some of the opposite side turn portions of the coils are received with the liquid adhesive material fed thereinto while at least generally impeding the fill of the slot means of the lamination stack in which the other of the opposite side turn portions of the coils are received with the liquid adhesive material when the loose wound core is being rotated in the one direction;

passing some of the liquid adhesive material flowed into the slot means therefrom generally by capillary action into wetting relation between at least some of the interfacing lamination surfaces in the lamination stack;

interrupting the feeding of the liquid adhesive material onto the opposite end turn portions of the coils at least when a preselected volume of the liquid adhesive material has been fed thereto during the rotation of the loose wound core in the one direction;

terminating the rotation of the loose wound core in the one direction;

reestablishing the rotation of the loose wound core in another direction opposite the one direction at a speed generally between the preselected low and high values thereof;

repeating the feeding step while the core is being rotated in the another direction;

flowing the liquid adhesive material from the opposite end turn portions of the coils generally along the opposite side turn portions of the coils into the slot means of the lamination stack in which the side turn portions of the coils are received and filling at least in part the slot means in which the other opposite side turn portions of the coils are received with the liquid adhesive material fed thereinto while at least generally impeding the liquid adhesive material fill of the slot means of the lamination stack in which the some opposite side turn portions of the coils are received when the loose wound core is being rotated in the another direction thereby to generally equalize the liquid adhesive material fill of the slot means of the lamination stack;

repeating the passing step;

ceasing the feeding of the liquid adhesive material onto the opposite end turn portions of the coils at least when anothter preselected volume of the liquid adhesive material has been fed thereto during the rotation of the loose wound core in the another direction with the another preselected volume of the liquid adhesive material supplementing the first named preselected volume of the liquid adhesive material fed onto the opposite end turn portions of the coils during the rotation of the loose wound core in the one direction so as to at least generally saturate the winding means with the liquid adhesive material; and

heating further at least the loose wound core to effect the hardening of the liquid adhesive material contained in the winding means and the lamination stack thereby to effect the bonding of the loose wound core into the generally unitary mass.

4,559,699

METHOD OF CONSTRUCTING A PADMOUNTED DISTRIBUTION TRANSFORMER

Timothy C. Owen, and Charles J. Witzigman, both of Jefferson City, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1984, Ser. No. 618,844
Int. Cl.[4] H01F *41/00*
U.S. Cl. 29—602 R 5 Claims

1. A method of constructing a padmounted distribution transformer including a top-loaded tank having terminals on a recessed terminal wall, a terminal cover pivotally attached to the tank, and a sill which supports the cover in its closed position, comprising the steps of:

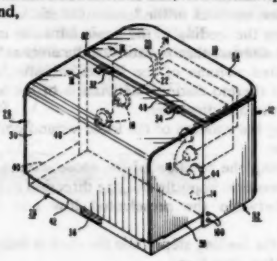
forming the terminal wall of the tank with an integral flange having upper and lower surfaces, said flange forming a front panel extension which recesses the terminal wall,

securing a metallic bar to one of the surfaces of said integral flange,

assembling tank components, including the terminal wall, to provide a tank having an opening at its upper end,

painting said tank,

attaching components to the terminal wall, including electrical terminals,
placing a core-coil assembly and liquid dielectric in said tank,
welding a tank cover on said tank, to seal the opening at its upper end,



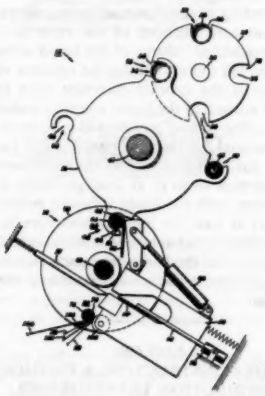
attaching the terminal cover to said tank,
closing said terminal cover to protect the terminal wall, and painting at least the area which includes the tank cover weld.

4,559,700

METHOD FOR WINDING AN ELECTRODE ASSEMBLY

Raymond K. Sugalski, Gainesville, and John J. Strickland, Alachua, both of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Sep. 10, 1984, Ser. No. 648,918
Int. Cl.[4] H01M *6/10, 4/88*
U.S. Cl. 29—623.1 **10 Claims**



1. A method for contemporaneously winding into a cylindrical configuration first and second unwound electrode assemblies of an electrochemical cell, each of said assemblies comprised of a negative electrode strip, a positive electrode strip and a separator disposed therebetween, said method comprising the steps of:
providing first and second winding stations;
partially winding at said first winding station said first unwound electrode assembly into a first partially wound electrode assembly;
transferring said first partially wound electrode assembly from said first winding station to said second winding station;
further winding at said second winding station said first partially wound electrode assembly; and
partially winding at said first station said second unwound electrode assembly into a second partially wound electrode assembly contemporaneously with said further winding of said first partially wound electrode assembly at said second winding station.

4,559,701

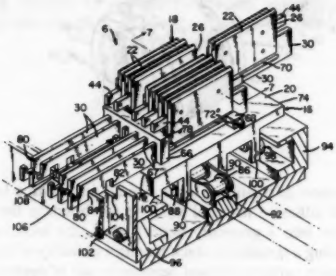
Patent Not Issued For This Number

4,559,702

HARNESS MAKING MACHINE HAVING IMPROVED WIRE JIG

Werner Maack, Seeheim; Michael Gerst, Worms, and Manfred Liedloff, Dieburg, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 14, 1983, Ser. No. 551,621
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—759 **9 Claims**



1. A harness making machine of the type comprising a conveyer which is indexible in a first direction, a plurality of wire processing machines located at spaced-apart intervals on one side of the conveyer, and a plurality of wire jigs on the conveyer, each of the wire jigs being capable of holding a plurality of wires in side by side parallel relationship with end portions of the wires extending to the one side of the conveyer so that the wires are presented to the processing machines as the conveyer is indexed, the harness making machine being characterized in that:
each of the wire jigs comprises a frame which is fixed to the conveyer and a wire clamping assembly on the frame,
the wire clamping assembly comprising a plurality of individual wire clamps each of which is capable of holding at least one wire, the wire clamps being normally disposed in normal positions in which the clamps on each of the wire jigs are in aligned side by side relationship in a stack, the clamps on each of the wire jigs being independently movable from the stack to an extended position, an individual clamp in its extended position being displaced laterally of the stack towards the one side of the conveyer, and
clamp moving means are provided proximate to the processing machines for selectively moving individual clamps to their extended positions at the processing machines, whereby, during continuous operation of the harness making machine, the wires in each wire jig are selectively presented to the wire processing machines.

4,559,703

PROCESS FOR SILVER PLATING ROTARY CONTACT ASSEMBLIES

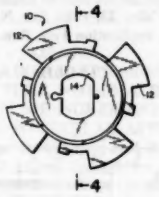
Donald F. Gagas, Milwaukee, Wis., assignor to Centralab, Inc., Milwaukee, Wis.

Filed Apr. 24, 1984, Ser. No. 603,526
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—876 **1 Claim**

1. The process of making a rotary switch contact assembly comprising the steps of:
(1) stamping a piece of hard brass plate to a desired shape;

force fitting a molded plastic rotor retainer piece into said stamped contact plate;

immersing said assembly of rotor retainer and contact plate in a silver plating bath having a fine silver and also having 5 mm electroless copper-plated plastic balls as fillers;



applying a current of 40 to 50 amps for a cycle time of 20 to 25 minutes;

removing said rotor assemblies from said bath.

4,559,704

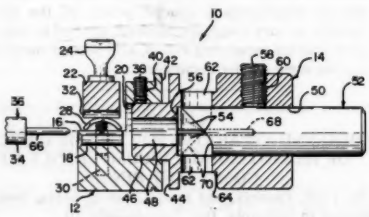
TOOL AND METHOD FOR TRIMMING COAXIAL CABLE

George W. Michael, III, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 408,959, Aug. 17, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 667,076

Int. Cl.[4] H02G 1/12

U.S. Cl. 30—90.1 **16 Claims**



1. A tool for trimming an end of a coaxial cable, comprising:

cable-holding means having clamping means thereon for clamping an end of the coaxial cable to be trimmed in position thereby;

cutter-holding means having cutter means secured thereto and being in axial alignment with a bore of said cutter-holding means in which the cable end to be trimmed is to be disposed for engagement by said cutter means to trim the same;

section means of said cable-holding means and said cutter-holding means being slidably matable and including said bore;

stop surfaces adjacent said section means for positioning said section means relative to each other according to an amount of trimming that is to be done to the cable end; and

securing means to secure said section means at said amount of trimming, said securing means to be unsecured when the cable end to be trimmed is clamped in position along said bore and against said cutter means whereafter said cutter means is operated to trim the cable end until said stop surfaces engage.

4,559,705

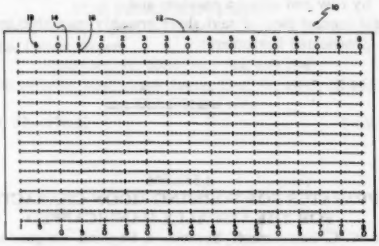
INDEXING OVERLAY FOR VIDEO DISPLAY DEVICES

Michaela W. Hodge, and Robert J. Hodge, both of 5757 Ravenspur Dr., #8, Rancho Palos Verdes, Calif. 90274

Filed Nov. 25, 1983, Ser. No. 554,884

Int. Cl.[4] G01B 3/00

U.S. Cl. 33—1 B **10 Claims**



1. A computer video display overlay for detachable electrostatic adhering to the face of a video display for indexing a predetermined number of columns and rows of positions corresponding to a predetermined number of columns and rows, respectively on the display, for allowing visual detection of the display through the overlay and comprising, in combination:

a body member comprising a flexible, transparent electrostatic charge accepting sheet, said sheet being at least a preselected number of display columns wide and a preselected number of display rows high, and said sheet having a first surface and a second surface and a preselected thickness therebetween for detachable electrostatic attachment to the face of the video display, and said first surface of said sheet contiguous the face of the video display for said electrostatic attachment thereto;

a plurality of first indicia on said first surface of said sheet and visually detectable through said sheet from regions spaced external from said second surface of said sheet, and said first indicia comprising parallel rows in a first spaced array, each of said rows comprised of a plurality of spaced apart dashes, extending a preselected distance in the width of said sheet, each of said dashes of said first indicia in each row in aligned relationship with the other dashes in said row, and readable against the background of underlying symbols on the computer video display, one of said dashes of said first indicia placed at each of the displayable columnar positions in each of said rows;

a plurality of second indicia on said first surface of said sheet and visually detectable through said sheet from regions spaced external said second surface of said sheet, said second indicia comprising substantially parallel columns in a second spaced array of dashes extending a preselected distance in the height of said sheet, each of said dashes of said second indicia in each column in the spaced array and in alignment with each of the other dashes in said column and readable against the background of underlying symbols on the computer video display, said second indicia extending substantially perpendicularly to said rows of said first indicia, and said second indicia spaced apart and placed substantially coextensive with said first indicia, a first of said second indicia at a preselected columnar position in each of said rows of said first indicia, the combination of said first and second indicia being perceivable by the user as different from said first indicia alone;

said first spaced array and second spaced array defining first, second, third, and fourth margins between said first and second indicia, and each of the four edges of said sheet;

a plurality of first labeling indicia on said first surface of said sheet in a first of said margins and visually detectable through said sheet from regions spaced external said second surface, and readable against the background of un-

derlying symbols on the computer video display, said first labeling indicia comprising numeric indicia of cumulatively numbering said first indicia and placed adjacent each column of said second indicia, whereby the user can detachably attach said sheet by electrostatic attraction to the face of said computer video display to index preselected displayable positions on the computer video display by row and column number; and

said second face of said sheet erasably markable upon by preselected instruments.

4,559,706

APPARATUS FOR FORMING MOON CHARACTERS FOR THE VISUALLY HANDICAPPED

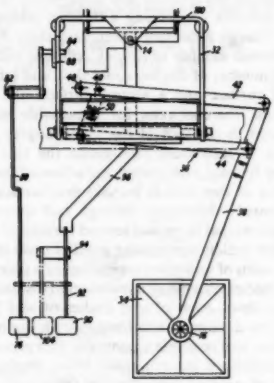
Gerd W. C. Sommerhoff, Sevenoaks, England, assignor to Possum Controls Limited, Slough, England

Filed Jun. 28, 1984, Ser. No. 625,664

Claims priority, application United Kingdom, Jul. 1, 1983, 8317995

Int. Cl.⁴ B43L *13/10*; B41J *5/00*

U.S. Cl. 33—23 R **13 Claims**



1. A sheet material embossing machine for generating a line of embossed characters, said machine comprising a sheet material support, an embossing stylus, stylus moving means operable to move said stylus with respect to said support into and out of a position in which said stylus impresses sheet material supported on said support, a finger board, a manually movable describing member positioned above the finger board, tracery means on the finger board for guiding said manually movable describing member positioned above the finger board operable to effect movement thereof in a horizontal plane above the finger board to describe the character to be embossed on the sheet material on said support, a coupling between said describing member and one of said stylus and said support, said coupling causing relative movement between said stylus and said support, said relative movement following movement of said describing member, said machine further comprising drive means operable to move said support in a transverse, stepwise manner relative to said stylus to present successive transverse areas of the sheet material supported on said support to said stylus, and means for effecting stepwise longitudinal movement of the sheet material relative to the stylus to present successive longitudinal areas of the sheet material supported on said support to said stylus.

4,559,707

ERROR CORRECTION SYSTEM FOR LENGTH MEASURING DEVICE

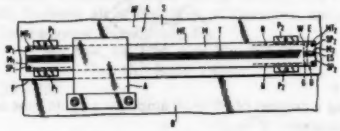
Johann Oberhans, Emertsham, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,506

Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319600

Int. Cl.⁴ G01B *11/04*

U.S. Cl. 33—125 C **11 Claims**



1. In a length measuring device of the type comprising a scale carrier mounted to a first object, a scale fastened rigidly at least at first and second longitudinally spaced points to the scale carrier and slightly longitudinally shiftable with respect to the scale carrier therebetween, and a scanning unit secured to a second object movable relative to the first object so as to scan the scale to measure the relative positions of the first and second objects, the improvement comprising:

first means, defined by the scale carrier, for accommodating changes in length of the scale carrier between the first and second longitudinally spaced points of the scale such that the scale carrier itself is variable in length between the first and second points in order to vary the longitudinal forces applied by the carrier to the scale; and

second means for engaging the scale carrier directly to adjustably position the first means so as to adjust the effective length of the scale carrier between the first and second longitudinally spaced points of the scale and thereby to vary longitudinal forces applied to the scale so as to correct measuring errors, said second means engaging the scale carrier exclusively.

4,559,708

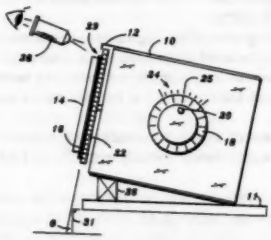
METHOD AND APPARATUS FOR THE MEASUREMENT OF THE INTERNAL CIRCUMFERENCE OF COMPLIANT RINGS

Don M. Duel, Phoenix, and Fred J. Smith, Mesa, both, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1982, Ser. No. 402,512

Int. Cl.⁴ G01B *5/00*

U.S. Cl. 33—178 R **7 Claims**



1. An apparatus for measuring the internal circumference of a compliant ring comprising:

a compliant ring having an internal circumference:

a rotatable cylinder having a known circumference less than said internal circumference of said compliant ring such that as said rotatable cylinder is rotated said internal cir-

cumference of said compliant ring will follow the circumference of said rotatable cylinder causing said compliant ring to rotate; and

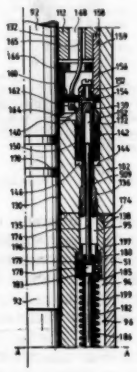
measuring means for measuring an angle of rotation of said rotatable cylinder, said measuring means having a portion suitable for attachment of said rotatable cylinder.

4,559,709

APPARATUS FOR MEASURING THE INTERNAL DIMENSIONS OF A TUBE, NOTABLY IN A WELL, AND DISPLACEMENT MEASUREMENT METHOD APPLICABLE TO SUCH AN APPARATUS

Jean H. Beseme, Veneux-les-Sablons; José R. Corral, Vaux-le-Pénil, and Bernard J. Glotin, Saint-Maur, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,232
Claims priority, application France, Dec. 23, 1981, 81 24179
Int. Cl.⁴ G01B *7/12, 7/28*
U.S. Cl. 33—178 F **13 Claims**



1. Apparatus for measuring the internal dimensions of a tube, notably in a well, comprising:

an elongated sonde body member movable within the tube to be measured;

a plurality of sensing fingers mounted on the sonde body member for contacting the walls of the tube and movable with respect to the sonde body member in response to variations in the internal transverse dimensions of the tube when the sonde body member is moved within the tube;

a barrell structure linked with the sonde body member to provide an interior space sealed against exposure to the pressure prevailing in the tube; and

a displacement transducer associated with each sensing finger, comprising:

a blind tube protruding in a sealed manner into the interior space of the barrel structure so that at least part of the outer surface at the closed end of the blind tube is sealed within the interior space, while the inside of the blind tube is exposed at the open end to the pressure prevailing in the tube to be measured;

a mobile element extending into the inside of the blind tube through its open end;

detection means located within the interior space in a position around the at least part of the outer surface of the blind tube, the detection means being sensitive to variations in the position of the mobile element within the blind tube to produce an electrical signal corresponding to the movement of the mobile element; and

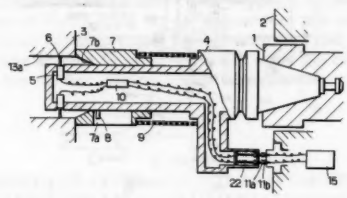
transmission means mechanically linking the mobile element and the resepective sensing finger to cause movement of the mobile element within the blind tube in response to movement of the finger.

4,559,710

METHOD OF CHECKING PALLETS OR ARTICLES TO BE WORKED BY AUTOMATICALLY MEASURING AVERAGE DIAMETER OF HOLE AND APPARATUS FOR PRACTICING SAME

Seido Koda, Mino, Japan, assignor to Osaka Kiko Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 659,756
Claims priority, application Japan, Oct. 13, 1983, 58-192247
Int. Cl.⁴ G01B *7/12*
U.S. Cl. 33—178 E **5 Claims**



1. An apparatus for automatically measuring an average diameter of a hole, comprising:

a body having a distal end with a peripheral surface, and a tapered shaft insertable in a main spindle of a machining center;

a plurality of displacement detecting elements provided in said body so as to be capable of being projected and retreated from said peripheral surface of said distal end of said body;

a protection ring provided on said body and having a tapered surface cooperable with said displacement detecting elements, said protection ring being displaceable along an axial direction of said body;

an elastic member mounted on an outside circumferential surface of said body and urging said protection ring forwardly of said body;

an operational amplifier circuit provided in said body in operable connection with outputs of said plurality of displacement detecting elements;

first connecting terminals provided on said body in operable connection with said operational amplifier circuit; and

second connecting terminals, corresponding to said first connecting terminals, provided on said main spindle and in operable connection with a controller of said machining center;

said first connecting terminals being urged into electrical contact with said second connecting terminals by a second elastic member provided on said body whereby said operational amplifier circuit is operatively connected with said controller.

4,559,711

WORKPIECE GAGING APPARATUS

William L. De Boynton, Arcadia; Frederick C. Lee, South Pasadena; Bruce E. Wilson, Chino, and John F. O'Rourke, Hacienda Heights, all of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Jun. 23, 1982, Ser. No. 391,475
Int. Cl.⁴ G01B *5/16*
U.S. Cl. 33—199 R **17 Claims**

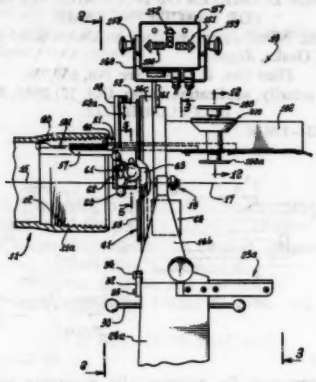
1. In an instrument for gaging surfaces of a workpiece, the combination comprising

(a) a gaging part engageable with the work surfaces,

(b) carriage structure for said part, said structure including a first slide section movable longitudinally, a second slide section movable laterally, relative to the first slide section,

and a rotor for rotating at least a first of said sections and said part about an axis that extends generally longitudinally, one of said slide sections carried by other, and frame means supporting said carriage structure for said slide section movement and rotor rotation,

(c) and indicator means operatively connected with said part



for indicating the status of displacement of the gaging part relative to a surface to be gaged,

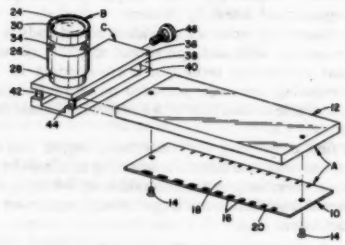
(d) and including a mounting for said part adapted to deflect upon pressural engagement of said part with a surface to be gaged, said indicator means including sensor means associated with said mounting to signal the extent of said deflection.

4,559,712

CUTTER TIP MEASURING DEVICE

William T. Kubetin, 50 E. 209th St., Euclid, Ohio 44123

Filed Apr. 27, 1984, Ser. No. 604,981
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—201 **20 Claims**



1. A portable measuring device comprising:

template means for measuring the width of an associated cutter tip, said template means having a plurality of spaced width indicator marks of different sizes positioned along at least one periphery thereof;

magnification means for magnifying at least one of said plurality of width marks; and,

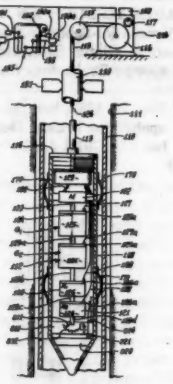
housing means for slidably supporting said magnification means on said template means, an aperture being provided in said housing means adjacent said one periphery so that a width comparison can be made on said cutter tip when positioned in said aperture against said one periphery and aligned with one of said plurality of width indicator marks.

4,559,713

AZIMUTH DETERMINATION FOR VECTOR SENSOR TOOLS

Paul W. Ott, Pasadena; Harold J. Engebretson, Yorba Linda; Philip M. LaHue, West Lake Village, and Brett H. Van Steenwyk, San Marino, all of Calif., assignors to Applied Technologies Associates, San Marino, Calif.

Continuation-in-part of Ser. No. 351,744, Feb. 24, 1982, Pat. No. 4,433,491. This application Dec. 6, 1983, Ser. No. 558,598
Int. Cl.[4] G01C *19/38*
U.S. Cl. 33—302 **41 Claims**



1. In mapping or survey apparatus using a single inertial angular rate sensor and a single acceleration sensor, one or both with input axes of sensitivity nominally canted relative to a well or borehole axis, rotated about the borehole axis and both sensors having outputs, the combination comprising

(a) means responsive to the accleration sensor output together with the inertial angular rate sensor output to compute from the rate sensor output the components thereof in the horizontal plane and the vertical plane, and

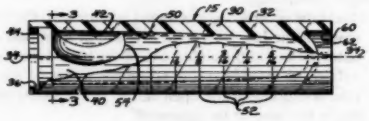
(b) means to derive azimuth as the Arcsin of the component of sensed inertial angular rate in the horizontal plane normal to the plane containing the borehole axis and the gravity vector divided by the horizontal plane component of the earth's angular velocity vector.

4,559,714

PITCH MEASURING APPARATUS

Randall J. Wright, 3535 Studio Ct., Brookfield, Wis. 53005

Continuation of Ser. No. 222,611, Jan. 5, 1981, abandoned. This application Feb. 15, 1983, Ser. No. 466,718
Int. Cl.[4] G01C *9/24*
U.S. Cl. 33—379 **6 Claims**



1. An apparatus for measuring the pitch relationship of first and second lines, comprising a body having an axis defining the first line, the body having an outer surface portion oriented in precise pre-selected alignment with the axis, the body having a cavity provided with an opening, the cavity being oriented in precise pre-selected alignment with the axis and outer surface portion and having a larger cross-section adjacent a first end of the body than at the other, wherein the cross-section of the cavity adjacent the first end of the body decreases progres-

sively and incrementally in the direction of the other end of the body to generally define a truncated ellipsoid, a predetermined quantity of liquid disposed in the cavity insufficient to completely fill the cavity, closure means for hermetically sealing the opening to prevent escape of liquid from the cavity and providing a bubble of predetermined magnitude in the cavity, and indicator means on the body oriented to the axis, the outer surface portion, the bubble and the cavity to provide visually observable pitch information when the body is placed adjacent an element providing a second line oriented to the first line provided by the axis.

4,559,715

DRAFTING MACHINE

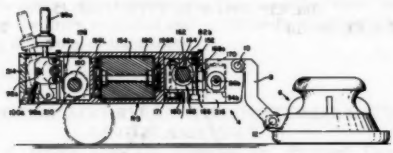
Walter Weglin, 945 Sunset La., Bellevue, Wash. 98004

PCT No. PCT/US83/01553, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01330, PCT Pub. Date Apr. 12, 1984

Continuation-in-part of Ser. No. 428,726, Sep. 30, 1982, Pat. No. 4,438,569. This PCT application Sep. 29, 1983, Ser. No. 616,825

Int. Cl.[4] B43L *13/00*

U.S. Cl. 33—438 **9 Claims**



1. A drafting machine for use with a drafting table having a drawing surface, which comprises:

a protractor head adapted to be movably mounted on a drafting table such as to permit horizontal and vertical movement of the protractor head along the drawing surface of the drafting table;

an elongated first mounting means rotatably mounted on the protractor head and having an elongated first reference scale, the longitudinal axis of the first reference scale being parallel to the longitudinal axis of the first mounting bar;

an elongated second mounting means slidably mounted on the first mounting means with the longitudinal axis of the second mounting means being perpendicular to the longitudinal axis of the first mounting means, the second mounting means having an elongated second reference scale, the longitudinal axis of the second reference scale being parallel to the longitudinal axis of the second mounting means;

first and second elongated straight edges, said first straight edge being slidably mounted with respect to the second mounting means and the second straight edge, the longitudinal axis of the first straight edge being parallel to the first mounting means and being perpendicular to the longitudinal axis of the second mounting means and to the second straight edge, the first straight edge being alignable with the reference scale of the second mounting means;

said second straight edge being mounted on the second mounting means so as to be slidably mounted with respect to the first mounting means, the longitudinal axis of the second straight edge being perpendicular to the longitudinal axis of the first mounting means, the second straight edge being alignable with the first reference scale;

top, bottom, and center rails, each having a respective rack therealong;

first mounting means for mounting the top and bottom rails on the drafting table in parallel spaced relation;

second mounting means for mounting the center rail on the top and bottom rails for movement therealong with the center rail perpendicular to the top and bottom rails;

a carriage guided along the center rail and carrying said protractor head;

first adjusting means on the carriage normally arranged to operate with the rack on the center rail for finely adjusting and setting the position of the carriage lengthwise of the center rail;

second adjusting means on the center rail normally arranged to operate with the racks on the top and bottom rails simultaneously for finely adjusting and setting the position of the center rail lengthwise of the top and bottom rails;

first and second deactivating means for selectively deactivating said first and second adjusting means, respectively; and

first and second biasing means opposing deactivation by said deactivating means, said center rail being adapted to be moved freely along the top and bottom rails when the second adjusting means is deactivated, and said carriage being adapted to be moved freely along the center rail when the first adjusting means is deactivated.

4,559,716

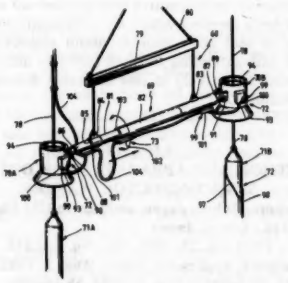
METHOD AND APPARATUS FOR DETERMINING THE DISTANCE AND ANGULAR ORIENTATION BETWEEN TWO STRUCTURALLY UNCONNECTED MEMBERS

Arthur C. Daughtry, and William M. McDonald, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Jun. 18, 1984, Ser. No. 621,979

Int. Cl.[4] G01B *5/00, 5/14*

U.S. Cl. 33—529 **17 Claims**



1. An apparatus for remotely determining the distance and angular orientation between two structurally unconnected members, said apparatus comprising:

two guide posts, each of said guide posts fixedly attached adjacent to, in a known spaced relationship with, one of said structurally unconnected members;

a variable length frame member having two ends;

two guide members movably secured, respectively, to said ends of said frame member, each of said guide members corresponding to and adapted to mate with one of said guide posts, whereby each of said guide members acquires a specific angular orientation with respect to said frame member upon mating with said guide posts;

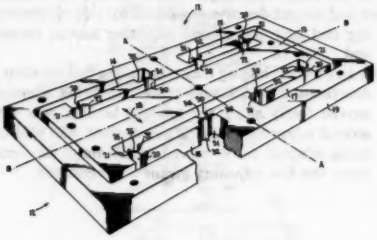
positioning means associated with each of said guide members and its corresponding guide post for positioning each guide member on its respective guide post as said guide member is mated with said guide post; and

means for recording the distance between said ends of said frame member and for recording the specific angular orientation of each of said guide members with respect to said frame member, after said guide members have been mated with said guide posts.

4,559,717
FLEXURE HINGE

Fredric E. Scire, Frederick, and E. Clayton Teague, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 21, 1984, Ser. No. 581,831
Int. Cl.[4] G01B 5/00
U.S. Cl. 33—568 24 Claims

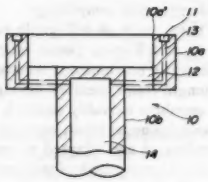


1. A flexure hinge comprising:
a body member of solid material and having length, width and thickness dimensions, said body member having: first and second generally longitudinally-extending edges and first, second and third recesses defined part-way through said body member in sa'd width dimension and completely through said body member in said thickness dimension, said first recess being defined in said first edge, said second and third recesses being defined in said second edge, said first recess being separated from each of said second and third recesses by respective first and second web portions of said body member which are sufficiently thin to permit flexure of said body member about respective first and second axes extending through said first and second web portions, respectively in said thickness dimension of said body member.

4,559,718
METHOD AND APPARATUS FOR DRYING SEMICONDUCTOR WAFERS

Hideo Tadokoro, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,134
Claims priority, application Japan, Aug. 2, 1983, 58-140466; Aug. 2, 1983, 58-140467; Aug. 2, 1983, 58-140468
Int. Cl.[4] F26B 5/08
U.S. Cl. 34—8 21 Claims

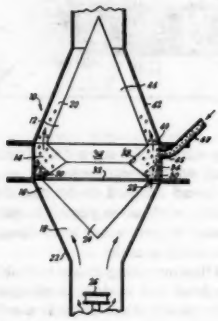


1. A method for drying a semiconductor wafer, comprising the steps of
(a) holding said wafer on a first rotating element in a manner such that a first portion of one surface of said wafer is stuck on said first rotating element;
(b) rotating said first rotating element together with said wafer held thereon to produce centrifugal force sufficient to cause dissipation of moisture on portions of the surfaces of said wafer other than said first portion thereof to thereby remove said moisture from said portions of the surfaces of said wafer other than said first portion thereof:
(c) holding said wager on a second rotating element in a manner such that a second portion of said one surface of said wafer other than said first portion thereof is stuck on said second rotating element;
(d) releasing said first rotating element from said one surface of said wafer; and
(e) rotating said second rotating element together with said wafer held thereon to produce centrifugal force sufficient to cause dissipation of residual moisture on the surfaces of said wafer including at least said first portion thereof to thereby remove said residual moisture from said wafer.

4,559,719
METHOD FOR PROCESSING MATTER IN A TURBULENT MASS OF PARTICULATE MATERIAL

Christopher E. Dodson, Reading, England, assignor to Torftech Limited, London, England

Division of Ser. No. 391,927, Jun. 24, 1982, Pat. No. 4,479,920.
This application Nov. 23, 1983, Ser. No. 554,682
Claims priority, application United Kingdom, Jun. 29, 1981, 8119977; Jan. 6, 1982, 8200311
Int. Cl.[4] B01J 8/38; F27B 15/08, 15/10
U.S. Cl. 34—10 2 Claims



1. A method for processing matter in a turbulent mass of particulate material, comprising:
generating a swirling flow of fluid within an annular processing zone which is radially, inwardly enlarged in a region between the upper and lower axial limits of said zone by imparting a rotational motion upon a fluid stream which is introduced through the lower axial limit of said zone;
introducing a stream of particulate material into said enlarged region so as to entrain the particulates within said fluid stream, wherein the shape of the zone maintains a compact, annular turbulent band of said particulate material in response to the flow rate of the fluid stream;
processing said particulate material within said zone and;
removing the processed material and fluid from said annular processing zone.

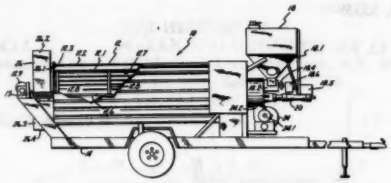
4,559,720
PARTICLE ROASTER

Richard H. Marquardt, Litchfield, Minn., assignor to Fabridyne, Inc., Litchfield, Minn.

Continuation of Ser. No. 277,812, Jun. 26, 1981, abandoned.
This application Sep. 23, 1983, Ser. No. 535,044
Int. Cl.[4] F26B 17/32
U.S. Cl. 34—137 12 Claims

1. A roaster for roasting particulate material such as grain and comprising a cylindrical, generally horizontal drum having an axis of rotation and having an inner surface, means for

rotating the drum about its axis, heating means adjacent one end of the drum for directing heated gases inwardly of the drum, means for feeding particles to said one end of the drum, and means for withdrawing roasted particles from the other end of the drum, the roaster being characterized by including a plurality of longitudinally extending, spaced vanes positioned about and carried by the inner surface of the drum and angled



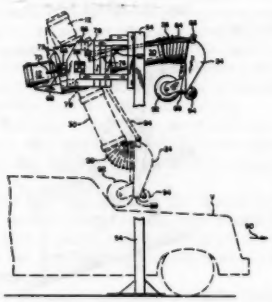
with respect to the rotational axis such that each vane along its length traverses the inner surface of the drum by a distance, measured circumferentially of the drum, of approximately the distance by which each such vane is spaced circumferentially from a neighboring vane, thereby providing a tortuous path between sheets of particulate material cascading from the vanes as the drum is rotated and significantly improving the roasting efficiency of the roaster.

4,559,721

TOP NOZZLE AIR DRYER WITH COUNTERBALANCED MOTOR ASSEMBLY

Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Continuation of Ser. No. 339,304, Jan. 1, 1982, Pat. No. 4,472,889. This application Sep. 24, 1984, Ser. No. 653,571
The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.
Int. Cl.⁴ F26B *19/00*
U.S. Cl. 34—229 **1 Claim**



1. In a self-balanced overhead-mounted assembly for drying a freshly washed vehicle, the improvement comprising:

a support structure;

means to advance the vehicle relative to the support structure;

an elongated blower means pivotally mounted to the support structure for movement about a pivot axis, the blower means comprising an integrated structure which includes a blower to discharge forced air, a nozzle to discharge forced air produced by the blower, the nozzle having an orifice positioned about the vehicle advancing thereunder, the pivot axis being disposed at an intermediate position between the blower and the nozzle, bifurcated duct members disposed between and in communication with the blower and the nozzle to deliver the air discharged from the blower to the nozzle, the blower being operatively connected to an impeller having a circumferential radial discharge and being positioned laterally between the duct members to provide an airstream of substantially uniform velocity to the nozzle;

a pivot mounting for the blower means, the mounting including adjustment means to provide for adjustable movement of the pivot axis relative to the length of the blower means to produce two adjustable moment arms having a substantially constant total length to substantially balance the static and dynamic forces about the pivot axis; and

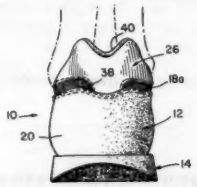
means to move the blower means about the pivot axis to provide clearance for the vehicle advancing therebelow.

4,559,722

CONSTRUCTION OF UPPER FOR ATHLETIC SHOE

Edward J. Norton, Ipswich, Mass., assignor to New Balance Athletic Shoe, Inc., Lawrence, Mass.

Filed Oct. 14, 1983, Ser. No. 542,027
Int. Cl.⁴ A43B *5/00, 19/00*
U.S. Cl. 36—89 **4 Claims**



1. Footwear for runners and the like including a sole, an upper received on said sole extending from said sole within each quarter portion and upper heel to a height below yet closely adjacent the ankle bone on each of the medial and lateral sides for increased support of the foot along said sides and around said heel, and a backtab providing an extension of said upper and supported by said quarter portions and upper heel around the heel toward each ankle bone, said backtab comprising inner and outer layers of sheet material and futher characterized by a body located between said inner and outer layers and supported by said layers formed solely of cushioning material, said body providing cushioning and stability to the foot of the wearer within the upper heel region over the Achilles tendon, and a notched area along an upper, rear marginal edge of said backtab to accommodate said Achilles tendon and reduce stress during the gait cycle of the foot of the wearer as otherwise may be occasioned by providing said extension of said upper in increasing support of the foot.

4,559,723

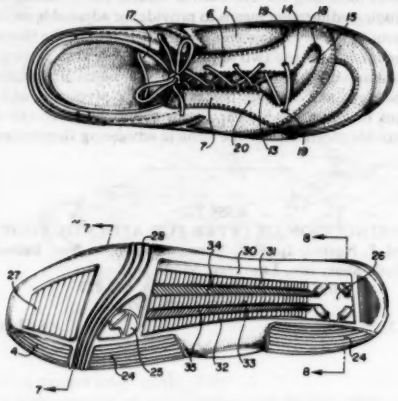
SPORTS SHOE

Norbert Hamy; Phillip Nutt, and Douglas Sheridan, all of Toronto, Canada, assignors to Bata Shoe Company, Inc., Belcamp, Md.

Filed Jan. 5, 1984, Ser. No. 568,390
Claims priority, application Canada, Jan. 17, 1983, 419619
Int. Cl.⁴ A43B *1/10*
U.S. Cl. 36—102 **16 Claims**

1. A sports shoe comprising a sole, and an upper having flaps with opposed edges adapted to be drawn together over the instep of the wearer with a shoelace, said opposed edges when drawn together substantially meeting along a line extending from the leg opening of the shoe towards the toe to a point where said edges part to define an elongate aperture asymmetrically disposed with respect to a centre line of the shoe and

extending at an oblique angle to said centre line in a generally transverse direction so as to follow the metatarsal flex path of



the wearer and thereby improve the flexibility and comfort of the shoe.

4,559,724

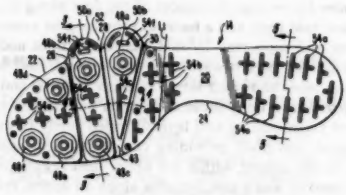
TRACK SHOE WITH A IMPROVED SOLE

Daniel E. Norton, Hampton, N.H., assignor to Nike, Inc., Beaverton, Oreg.

Filed Nov. 8, 1983, Ser. No. 549,657

Int. Cl.[4] A43B *5/00, 5/06, 13/14*

U.S. Cl. 36—129 **10 Claims**



1. A sole for a track sole comprising a plate formed of a first material extending along substantially the entire length of the sole, a plurality of traction cleats permanently attached to said plate, a plurality of spike fasteners attached to the forepart portion of said plate, a pair of lateral traction extensions extending upward from said plate, one of said traction extensions being located adjacent to the fifth metatarsal-phalanges joint and the other of said traction extensions being located forward of the fifth metatarsal-phalanges joint, said lateral traction extensions being separated from one another by a gap, first, second and third flex grooves being formed in said plate to enhance the flexibility of said plate along said grooves, said first flex groove extending parallel to a line between said first and second metatarsal-phalanges joints, said second flex groove extending generally along a line between said first and second metatarsal-phalanges joints and parallel to said first flex groove and being located rearward thereof, said third flex groove extending substantially parallel with a line extending along the second through fifth metatarsal-phalanges joints, said second and third grooves joining along the medial side of said sole, and said second groove extending across said plate to said gap between said lateral traction extensions.

4,559,725

ROTARY TILLER FOR MAINTAINING CROSS COUNTRY SKI TRAILS

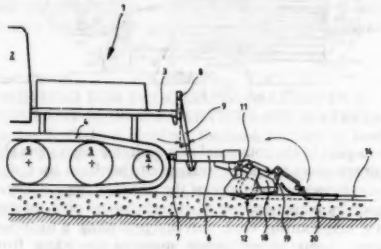
Erwin H. Wieland, Senden, and Walter Haug, Blaustein, both of Fed. Rep. of Germany, assignors to Karl Kassbohrer Fahrzeugwerke GmbH, Ulm, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,450

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333941

Int. Cl.[4] E01H *5/00*

U.S. Cl. 37—197 **3 Claims**



1. A method of maintaining a cross country ski trail having a center ski trail area flanked by adjacent pole track areas, comprising: tilling the ski track area to a first depth while simultaneously tilling the pole track area to a second depth which is less than said first depth, and impressing parallel ski tracks in the thus tilled ski track area.

4,559,726

SNOW MOVER

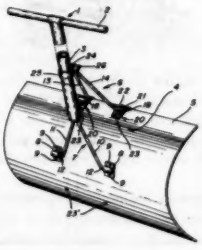
Marius Moisan, 4822 Legendre St., Contrecoeur, Canada (J0L 1C0)

Filed Nov. 13, 1984, Ser. No. 671,117

Claims priority, application Canada, Nov. 16, 1983, 441336

Int. Cl.[4] E01H *5/06*

U.S. Cl. 37—267 **4 Claims**



1. A snow mover comprising an elongated handle having a manual grip at one end, a blade slightly curved in cross-section to define a convex rear face and a concave front face, said blade rectangular in plan and having opposite parallel longitudinal edges, first bracket means fixed to said blade at said back face to the central portion of said blade, both longitudinally and transversely thereof, the opposite end of said handle pivoted to said first bracket means for pivotal movement about a first pivot axis parallel to and substantially equidistant from said two longitudinal edges, second bracket means detachably securable to said blade at said back face adjacent either one of said two longitudinal edges at the longitudinally central portion of said blade, securing means for removably securing said second bracket means to said blade, third bracket means fixed to said handle at a distance from said opposite end, link means extending between said second and said third bracket means

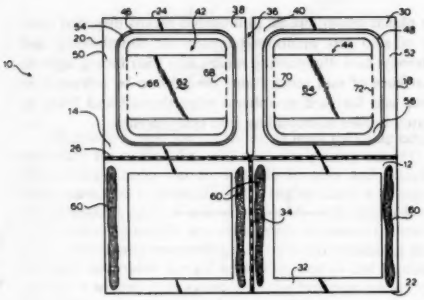
and pivotally secured to the same at its ends about second and third pivot axes parallel to said first pivot axis, said three pivot axes defining the apices of a triangle, means to adjust the distance between said first and said third pivot axes to adjustably change the angle of said blade in relation to said handle, and means to rotate one of said first and third bracket means through at least 180° about the longitudinal axis of said handle.

4,559,727

MARKETING DEVICE

Alexander Lewyt, 660 Madison Ave., New York, N.Y. 10021

Filed Sep. 12, 1983, Ser. No. 530,953
Int. Cl.⁴ G09F *3/18*
U.S. Cl. 40—10 R **5 Claims**



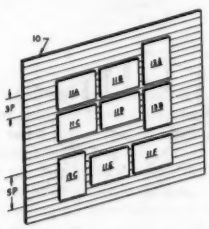
1. A mailable marketing device, which comprises;
a flat sheet of a flexible material having
(A) a planar upper surface;
(B) a planar lower surface;
(C) a first edge;
(D) a second edge opposite the first edge;
(E) a third edge connecting the first edge to the second edge;
(F) a fourth edge opposite the third edge and connecting the first edge to the second edge at a point opposite the connection made by the third edge (E); said first, second, third and fourth edges together forming the peripheral boundary of the sheet and joining the upper surface to the lower surface; said flat sheet also having
(G) a first fold line bisecting the sheet into first and second half-sheets, said fold line extending from a point midway along the first edge to a point midway along the second edge;
(H) a second fold line bisecting the second half-sheet into first and second quarter-sheets, said second fold line extending from a point midway along the third edge to a point on the first fold line midway between the first and second edges;
(I) a slot in the sheet extending inwardly from the fourth edge to the first fold line along a straight line between the terminus of the second fold line on the first fold line and a point on the fourth edge midway between the first and second edges, said slot bisecting the first half-sheet into third and fourth quarter-sheets;
(J) an aperture through the third quarter-sheet providing open communication between the upper and the lower surfaces of the sheet, said aperture together with the boundary of the third quarter-sheet forming an outer peripheral zone of the third quarter-sheet;
(K) an adhesive composition positioned in the outer peripheral zone;
(L) a removable, flat bridge positioned across the aperture, attached to the inner peripheral zone along a frangible tear line, said bridge having upper and lower surfaces adapted to receive indicia; said sheet being folded along the first fold line so as to bring the slot over the second fold line and the upper surface of the first half-sheet adjacent to the upper surface of the second half-sheet, secured thereto together by the adhesive composition; said second fold being visible through the slot; the area between the peripheral zone and the adjacent second half-sheet being open space; said folded sheet being foldable along the second fold line so as to bring the lower surface of the third quarter-sheet adjacent to the lower surface of the fourth quarter-sheet, the third quarter-sheet being separate from the fourth-quarter sheet and unsecured thereto together so that a wallet-type of photoframe is openable and closeable along the second fold line for access and covering of the aperture and the removable flat bridge.

4,559,728

DISPLAY MOUNTING DEVICE

Edison A. Price, New York, N.Y., assignor to Edison Price, Incorporated, New York, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,824
Int. Cl.⁴ G09F *1/10*
U.S. Cl. 40—124.2 **18 Claims**



1. A display mounting device comprising:
a planar support board;
at least one resilient, pre-curved slat having a concave inner surface and a convex outer surface;
longitudinally extending attaching means connected to the inner surface of said slat and spaced downwardly from the top edge thereof to connect the slat to the support board so that the upper and lower portions of said slat abut said board, whereby the top portion of said slat may be moved away from said board to permit the insertion of a bracket therebetween.

4,559,729

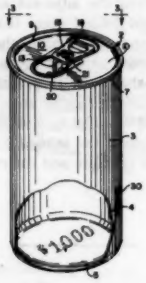
CONTAINER HAVING PRIZE INDICIA ON THE INTERIOR THEREOF

Roger B. White, Atlanta, Ga., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 12, 1981, Ser. No. 320,642
Int. Cl.⁴ B65D *1/12, 41/44;* G09F *23/00*
U.S. Cl. 40—306 **8 Claims**

1. In combination with a container having a body wall and an integral bottom end, a top end connected to the body and having an integral non-reclosable opening section and means securely connected to said openable section for opening said

section to provide a pour opening therein, and a prize indicia separately formed on the surface of the interior of said bottom



end in a position only visible through said pour opening and only after the disposal of the contents of said container.

4,559,730

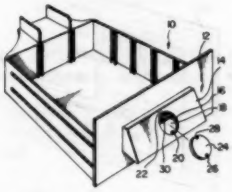
SYSTEM FOR LABELLING STORAGE DRAWERS

Alfred A. Burrell, 10223-133th St., Edmonton, Alberta, Canada

Filed Feb. 24, 1983, Ser. No. 469,307

Int. Cl.⁴ G09F *3/00*

U.S. Cl. 40—324 **13 Claims**



1. A storage compartment labelling system comprising

an attachment for a visible front face of each said storage compartment, said attachment including an upwardly and backwardly sloping front panel having a front face;

an opening in said front face of said panel;

a plate-like insert adapted to be removably inserted into said opening and adapted to display information relating to the contents of the compartment to which said attachment is attached, said insert conforming in shape to said opening and, when inserted, being flush with said front surface of said panel;

a support surface behind a major lower portion of said opening for supporting a lower portion of said insert and leaving an upper portion unsupported, whereby the application of pressure to said unsupported part will cause said insert to drop out of said opening; and

and wherein at least one of the orientation of said insert in said opening and the face of said insert to be displayed is selectively variable to thereby vary said information display.

4,559,731

ILLUMINATED SIGN CONSTRUCTION

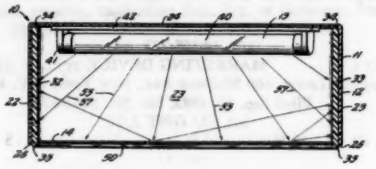
Mauricio Frois, and Daniel W. Leo, both of New York, N.Y., assignors to Ledan, Inc., New York, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,086

Int. Cl.⁴ G09F *13/18*

U.S. Cl. 40—546 **5 Claims**

1. Improved illuminated sign construction comprising: an outer housing element of relatively opaque material and defining a forwardly facing opening therein, an inner frame element of planar translucent synthetic resinous material having a degree of color distributed throughout the body thereof, said frame element having a forward peripheral edge disposed within the border of said opening in said housing element and defining a second forwardly facing opening; supporting means disposed within said second opening for supporting a transparency in planar condition, an illuminated means disposed rearwardly of said last mentioned means for illuminating said transparency; said illuminating means also distributing light to inner surfaces of said inner frame element to be refracted to exit from said forward peripheral edge thereof and form an illuminated border surrounding said transparency.



4,559,732

METHOD OF APPLYING SIGNS

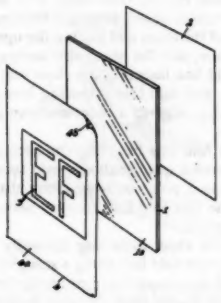
Leon A. Levy, Johannesburg, South Africa, and Anthony Matthews, London, England, assignors to Klingshield South Africa (Proprietary) Limited, Johannesburg, South Africa

Filed Jun. 9, 1983, Ser. No. 502,608

Claims priority, application South Africa, Jun. 9, 1982, 82/4053

Int. Cl.⁴ G09F *7/16*

U.S. Cl. 40—595 **7 Claims**



1. A method of applying a sign to a translucent panel comprising;

applying a film of material onto one side of the panel, the film of material being translucent to a viewer on said one side of the panel,

providing a mirror image of the sign on the other side of the panel, the mirror image of the sign being visible on the film to a viewer on said one side of the panel,

making cuts in the film corresponding to the mirror image,

removing the mirror image, and

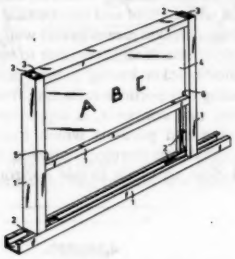
removing from the panel areas of the film so cut so as to leave behind on the panel areas of the film forming the sign when viewed from said other side of the panel.

4,559,733

SIGNBOARD RACK

Hans Forslund, Baggebytorg 8, S-181 35 Lidingö, Sweden

Filed Apr. 2, 1984, Ser. No. 596,157
Int. Cl.⁴ G09F *15/00*
U.S. Cl. 40—606 **5 Claims**



1. Signboard rack for receiving at least two side edges of a signboard (4) or the like, said rack comprising bars (1) of uniform cross-section cut to suitable lengths and adapted for interconnection at generally right angles relative to each other and consisting each of a hollow profile including a longitudinally extending slit (3), and connection members (2) made each in one piece, interconnecting said bars and consisting each of a first part insertable in said hollow in one of the profiled bars and also a second part joined with the first part via said slit and insertable in the end of another one of the bars and displaceable therein, characterized in that the first and second parts are joined with one another via a section of reduced width (9, 19) intended to extend through said slit (3), the bars (1) have supporting means arranged on the inside and longitudinally thereof, that said first and second parts consist each of a flat section (10,17) bearing on said inside supporting means and a section (11, 18) extending from one end of said flat section towards the inner wall right opposite the bar wall provided with slits, said section (11, 18) being joined with the section of reduced width, whereby the connection member is adapted to provide, for the accomodation of a signboard or the like, a continuous transition is said slits at a junction between two bars.

4,559,734

WORM BAITING TOOL

Kenneth Sauer, P.O. Box A-199, Camarillo, Calif. 93010, and Richard Fogo, 8841 Aberdare St., Ventura, Calif. 93004

Filed Feb. 10, 1984, Ser. No. 578,970
Int. Cl.⁴ A01K *97/00*
U.S. Cl. 43—4 **5 Claims**

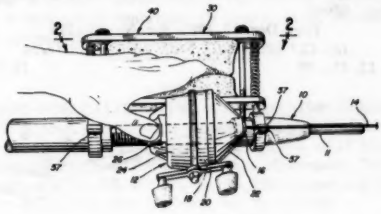
1. A tool for inserting a leader through a live worm or worm-like bait comprising:
- a narrow shaft having a forward pointed end for being inserted through bait;
- first and second notches in the shaft adjacent the pointed end and adjacent each other, each notch having adjacent, intersecting sidewalls, the first notch being closer to the pointed end of the shaft then the second notch, the first notch pulling the leader through the bait when the leader is attached to the first notch after the tool is inserted through the bait, the second notch pulling the leader through the bait when the leader is attached to the second notch before the shaft is inserted through the bait, and wherein the shaft is round and the pointed end is generally flat, the notches being formed in the flat portion of the shaft.

4,559,735

FISHING ROD AND REEL HOLDER FOR HANDICAPPED PERSONS

Philip Batick, Jr., 412 Hickory Hill Rd., Thomaston, Conn. 06787

Filed Jan. 8, 1985, Ser. No. 689,763
Int. Cl.⁴ A01K *97/10*
U.S. Cl. 43—21.2 **8 Claims**



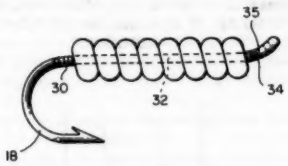
1. A holding apparatus for attachment to a fishing rod and reel combination, said apparatus comprising a pair of spaced apart side walls and a pair of spaced apart end rods extending transverse to the side walls, one end of each rod being secured to one wall and passing freely through the other wall, clamp means rigidly secured to each rod outboard of said other wall, spring means extending between the side walls for holding said side walls apart, pad means mounted on the facing surfaces of said spaced walls with an exposed edge of one pad abutting an exposed edge of the other pad, and means extending between the side walls for adjusting the distance between the side walls for preloading the spring means and the pads with a predetermined compressive load.

4,559,736

FISHING FLY

Joseph A. Sienkiewicz, Main St., Beaver Falls, N.Y. 13305

Filed Jul. 28, 1983, Ser. No. 517,959
Int. Cl.⁴ A01K *85/08*
U.S. Cl. 43—42.25 **13 Claims**



1. An artificial fly comprising
(a) a hook having a shank portion;
(b) a length of hollow plastic tubing sealed at both ends and wrapped transversely around a substantial length of said shank, said tubing having a specific gravity less than water;
(c) means to impart color to said tubing for desired color simulation, and
(d) means for securing said tubing to said shank.

10. A method of making an artificial fly comprising the steps of:

(a) sealing the ends of a hollow plastic tubing to form a sealed interior chamber, said plastic tubing having a specific gravity less than water;

(b) securing one end of said tubing to the shank portion of a fish hook;

(c) wrapping said tubing transversely around said shank portion so that said tubing at any point in the length thereof is in a plane perpendicular to the axis of said shank portion of said hook;

(d) securing the opposite end of said tubing to the opposite end of said shank portion of said hook, and

(e) imparting the desired color to said tubing for color simulation.

4,559,737

SNARE DEVICE

Richard J. Washington, 14060 Lake Wildwood Dr., Penn Valley, Calif. 95946

Filed Dec. 12, 1983, Ser. No. 560,215

Int. Cl.⁴ E05G *5/02;* **F41F** *1/00;* **F42B** *13/56*

U.S. Cl. 43—59 **18 Claims**

1. A snare device for use with a projection means comprising:

a Y-shaped member having a tubular body with opposite forward and rearward ends, said rearward end being in communication with said projection means, and two angularly disposed tubular barrels extending forwardly from said forward end of said body,

a pair of slotted projectiles each having a central axis and being interconnected by a flexible line having opposite ends wound around said slotted projectiles prior to projection of said projectiles from said tubular barrels;

one of said projectiles being received in each of said tubular barrels for projection therefrom whereby said projectiles move in diverging paths and rotate about their central axes so as to unwind said flexible line, the momentum of said projectiles causing said projectiles and said line to wrap around said object upon engagement of said line on said object.

4,559,738

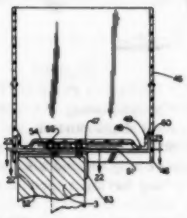
TOP SIDER PLANTER

Barbara Helfman, 2312 Central Ave., Middletown, Ohio 45042

Filed Apr. 9, 1984, Ser. No. 598,367

Int. Cl.⁴ A01G *9/02*

U.S. Cl. 47—66 **12 Claims**



1. A planter designed to be mounted upon a wall partition having horizontal surface terminating in two parallel vertical surfaces comprising:

a leakproof container having a side wall and a bottom, and an unobstructed open interior, said container including two longitudinal slots formed in said bottom of said container; and

a bracket means including means capable of being in friction contact with each of said two vertical surfaces to securely attach said bracket means to said wall partition, and means to securely attach said container to said bracket including a planter bracket having a base portion and upwardly projecting end portions extending from said base portion, whereby said container, is supported by said upwardly projecting end portions which friction fit within said longitudinal slots thereby positioning said container above and in close proximity to said horizontal surface.

4,559,739

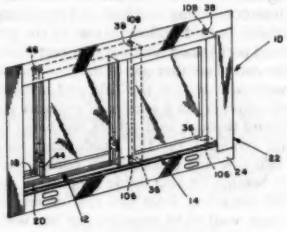
STABILIZED PIVOTABLE WINDOW

Michael S. Bayer, South Euclid, Ohio, assignor to Thermal-Barrier Products, Inc., Bedford, Ohio

Filed Nov. 28, 1983, Ser. No. 555,684

Int. Cl.⁴ E05D *15/22*

U.S. Cl. 49—177 **18 Claims**



1. A pivotable window assembly including a generally planar sash, parallel tracks extending along opposite sides of the sash to define a plane of sliding movement of the sash, and a pair of pivot members extending oppositely from the sash and defining an axis for pivoting the sash out of the plane of sliding movement, each of said pivot members including a foot portion, normal to the pivot axis, which extends away from the sash and in the plane of the sash and which engages a respective one of said tracks, each of said tracks including an opening for receiving a foot of one of said pivot members during pivoting of the sash out of the plane of sliding movement.

4,559,740

SLIDER ASSEMBLY FOR AUTOMOTIVE SLIDING DOOR

Yoshimasa Tuchiya, Ebina, and Tatsuo Minami, Isehara, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 22, 1983, Ser. No. 525,504

Claims priority, application Japan, Aug. 23, 1982, 57-145847

Int. Cl.⁴ E05D *15/10*

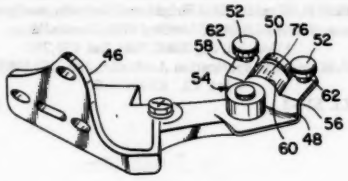
U.S. Cl. 49—216 **7 Claims**

1. A slider assembly for an automotive sliding door comprising:

a bracket mounted on said sliding door said bracket having a horizontal first section and a vertical second section, said horizontal section being bent to define a recessed portion;

a vertical roller rotatable about a horizontal axle extending from said second section of said bracket, said vertical

roller being adapted to be received in said recessed portion at least in part; and



a horizontal roller rotatable about a vertical axle extending from said first section of said bracket at a point near said horizontal axle.

4,559,741

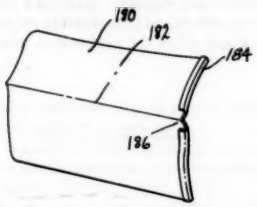
METHOD OF MAKING EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Co., Sunnyvale, Tex.

Continuation-in-part of Ser. No. 533,687, Sep. 19, 1983. This application Oct. 24, 1983, Ser. No. 544,908

Int. Cl.⁴ E05F *7/00*

U.S. Cl. 49—462 **11 Claims**



1. In the method of making an edge guard of generally U-shaped cross section having a metal base portion encapsulated by an insulating material, the steps of providing a flat strip of metal and a strip of insulating material, bonding the insulating material to one face of the metal strip, folding the sides of the insulating material around the side edges of the metal strip and adhering them onto the opposite face of the metal strip to form a seam such that said opposite face is substantially covered with insulating material and then forming the insulated strip thus formed into a generally U-shaped cross section with the seam disposed on the interior of the U-shaped cross section.

4,559,742

MACHINE FOR VIBRATORY GRINDING OF WORKPIECES

Ernst Heiberger, Dürnauer Weg 24, 7326 Heiningen, and Franz Heiberger, Schulstrasse 22, 7334 Süssen, both of Fed. Rep. of Germany

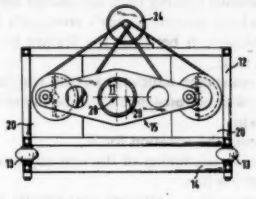
Filed Sep. 19, 1983, Ser. No. 533,303

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1982, 3234819

Int. Cl.⁴ B24B *31/06*

U.S. Cl. 51—163.1 **3 Claims**

1. A machine for the vibratory grinding of workpieces by means of abrasive bodies or the like, consisting of a cylindrical drum (11), a first frame (74), first spring elements (73) resiliently suspending said drum to said first frame (74), an oscillator (71), consisting of a drive motor (71) and at least one out-of-balance mass connected to said drum to cause said drum to vibrate, said drum being provided adjacent opposite ends with respective inlet and outlet means for the workpiece and abrasive-body mixture, the improvement comprising: a second frame (76) mounted on a foundation means (77), second spring elements (75) resiliently suspending said first frame to said second frame, said first and said second spring elements being pneumatic spring elements constituting resilient bearings and wherein sensor elements between said drum and said frames



determine and control the drum position at a substantially horizontal position of the drum (11) when it is completely filled with the workpiece/abrasive-body mixture by controlling supply or removal of compressed air to or from the pneumatic spring elements (73), (75).

4,559,743

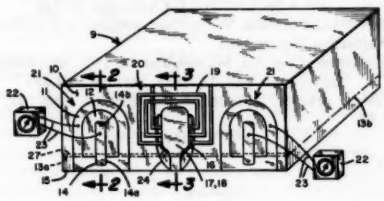
METHOD FOR CALIBRATING A MACHINING SENSOR

Alan G. Kracke, Minnetonka; Douglas J. Hennenfent, New Hope, and Allan L. Holmstrand, Bloomington, all of Minn., assignors to Magnetic Peripherals, Inc., Minneapolis, Minn.

Continuation of Ser. No. 430,194, Sep. 30, 1982, abandoned. This application Oct. 29, 1984, Ser. No. 665,865

Int. Cl.⁴ B24B *49/00*

U.S. Cl. 51—165 R **5 Claims**



1. A method for controlling the machining of a first edge of a surface on a workpiece from its initial location to adjacent an ideal final position line substantially parallel to the first edge and carried on the surface, and having a predetermined precise spacing from a feature line carried on the surface and substantially parallel to the first edge, comprising the steps of:

(a) forming at least one discrete machining sensor each having a sensing line falling between the initial location of the first edge and the ideal final position line, said sensing line being substantially parallel to the first edge, and having a precisely determined spacing from the feature line;

(b) forming a parallel-edged resistive conducting strip comprising resistive material of substantially constant thickness lying along the first edge's initial location and intersected by:

(1) extensions of each of the sensing lines, and

(2) the ideal final position lines, said resistive conducting strip having a less precise spacing from the feature line than has the sensing line of the discrete sensor;

(c) connecting a resistance measuring means across the resistive conducting strip, which means provide a signal indicative of the resistance of the conducting strip;

(d) connecting a continuity tester across each discrete sensor;

(e) machining the first edge of the surface toward the feature line until the continuity tester indicates that continuity of a discrete sensor has ceased; then without further machining

(f) analyzing the signal from the resistance measuring means to determine the resistance R across the resistive conducting strip;

(g) calculating a constant of inverse proportionally K from an equation one of the form h=K/R by substituting

(1) the known spacing from the feature line of the sensing line whose discrete sensor's continuity has ceased, for the distance h between the feature line and the first edge, and

(2) the resistance indicated by the resistance measuring means for the resistance R across the resistive conducting strip,

and solving the equation for K;

(h) continuing machining of the first edge toward the ideal final position line;

(i) while machining, analyzing periodically the signal from the resistance measuring means to determine the resistance R of the resistive conducting strip, and with the previously calculated value of K, calculating therefrom the current value of h using equation one; and

(j) ceasing machining when the value of h is reduced to within a predetermined range of the predetermined precise spacing between the ideal final position and feature lines.

4,559,744

PROCESS FOR MACHINING A SPUR GEAR BY MEANS OF A ROTATING GEAR-LIKE TOOL

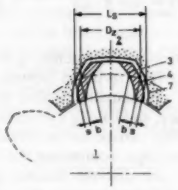
Walter Wirz, Pfäffikon, Switzerland, assignor to Reishauer AG, Wallisellen, Switzerland

Continuation of Ser. No. 342,960, Jan. 26, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 744,657

Claims priority, application Switzerland, Jan. 27, 1981, 516/81

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—287 **5 Claims**



1. A process for machining the teeth of a rotating gear workpiece by means of at least one rotating worm-shaped tool which can be moved toward engagement with the workpiece and upon reaching the desired distance between the axes of the tool and workpiece will rest against the workpiece with the ratio of the revolutions corresponding to a basic revolution ratio resulting from the ratio of the number of teeth of the workpiece and tool, comprising radially feeding said tool having a curved tooth thickness smaller than the final measurement of the width of the curved tooth gap of the workpiece to be produced relative to said workpiece until the desired distance between said axes is reached without contact and subsequently performing a controlled relative circular feed movement comprised of an additional rotating movement of one of said workpiece and tool which is superimposed on the corresponding basic revolution so that at least one flank of each tooth of said workpiece is machined, said circular feed movement being continously measured during the machining operation and stopped upon reaching a predetermined feed angle.

4,559,745

DEVICES FOR THE FIRE STOPPING OF PLASTICS PIPES

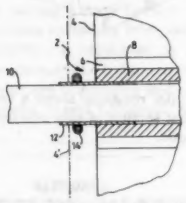
Jonathan B. Wexler, East Brighton, Australia, assignor to Fire Research Pty. Limited, Notting Hill, Australia

Filed Jul. 30, 1984, Ser. No. 635,792

Claims priority, application Australia, Jan. 19, 1984, PG3267

Int. Cl.⁴ E04H *9/00*

U.S. Cl. 52—1 **11 Claims**



1. In combination, a fire resisting partition having an opening therethrough, a plastics pipe passing through said partition via said opening, and a device for shutting off the pipe in the event of a fire, said device comprising a sheath of flexible refractory fabric positioned around a portion of the pipe within or adjacent said partition, and means for applying a radially compressive force to the sheath and pipe whereby to radially constrict the pipe and sheath when the pipe softens under the effect of heat.

4,559,746

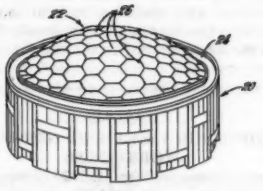
AIR-SUPPORTED FABRIC ROOF STRUCTURE

Michael W. Ishler, Toledo, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Aug. 22, 1984, Ser. No. 643,117

Int. Cl.⁴ E04B *1/34*

U.S. Cl. 52—2 **8 Claims**



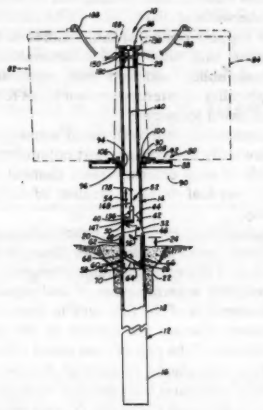
1. An air-supported fabric roof structure comprising a compression ring, three sets of generally equally spaced parallel cables arranged to define a grid of generally equilateral triangles with each cable having a pair of opposite end portions pivotally connected to the compression ring, and a plurality of generally hexagonal outer roof fabric panels secured to the cables from above, each of said panels covering six triangles of the grid and having three sets of opposite edge portions, the edge portions of each set being secured respectively to two outer cables of a group of three adjacent generally parallel cables of one of the sets of cables, and an intermediate cable of the group passing beneath the panel substantially along a bisecting diagonal thereof without being attached thereto.

4,559,747

CONTAINER SUPPORT APPARATUS

Thomas H. Engel, 3040 SW. 129th, Oklahoma City, Okla. 73170

Continuation-in-part of Ser. No. 503,324, Jun. 10, 1983. This application Oct. 24, 1984, Ser. No. 664,257
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—40 20 Claims



1. An improved container support device for supporting at least one refuse container, comprising:

a stationary tubular member disposable in the ground and having an upper end portion extendible a selected distance above the surface of the ground;

a telescoping tubular member supported by the stationary tubular member and slidably movable between a retracted position within the stationary tubular member and an extended position substantially above the surface of the ground, the telescoping tubular member having an upper portion and a lower portion, the lower portion having a first detent slot formed therein;

first stop means supported within the lower portion of the telescoping tubular member for selectively locking the telescoping tubular member in the extended position, the first stop means pivotally supported in the lower portion of the telescoping tubular member so that an end portion of the first stop means is selectively extendible through the first detent slot in the lower portion of the telescoping tubular member for engagement with the stationary tubular member so as to prevent movement of the telescoping tubular member to a retracted position when the first stop means is extended through the first detent slot;

support means slidably disposed about the the telescoping tubular member for supporting the container thereon when the telescoping tubular member is in the extended position, the support means adapted to engage the upper end portion of the stationary tubular member when the telescoping tubular member is in the retracted position;

handle means secured to the upper portion of the telescoping tubular member for selectively moving the telescoping tubular member between one of the extended position and the retracted position; and

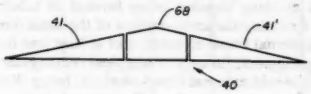
linkage means operably connected to the first stop means for selectively removing the first stop means from engagement with the stationary tubular member and for permitting the telescoping tubular member to be retracted into the stationary tubular member.

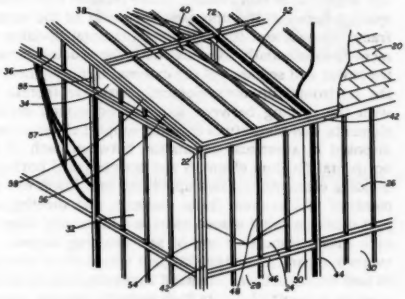
4,559,748

PRE-FORMED BUILDING SYSTEMS

Dennis E. Ressel, P.O. Box 5, Upland, Calif. 91786

Filed Jan. 28, 1983, Ser. No. 435,877
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—90 9 Claims





1. A pre-formed building system, for erection of a structure on a prepared foundation, comprising:

a plurality of support columns, disposed in a spaced apart relationship about the periphery of said foundation so as to be abuttingly aligned with internal surfaces of a pair of side walls and a pair of end walls, respectively, each support column being vertically oriented to rest on and to be anchored to said foundation, the spacing between said support columns being such that a single support column is situated substantially at each corner of the structure, a second single support column is situated a first spacing distance from the first support column in each horizontal direction from each corner toward each peripherally adjacent corner of the structure, a third single support column is situated a first spacing distance from the second support column in each horizontal direction progressing away from each corner, a fourth single support column is situated so as to abut with the third support column along their respective vertical edges in a direction progressing away from each corner column so as to form a double column, and said remaining support columns are situated as alternatingly single columns and abutting pairs so spaced along each half-extent of each of the side and end walls, such that an integer number of single support columns and an integer number of abutting pairs of support columns traverse the extent of each wall of the structure;

a plurality of saddles of a first type, said plurality of saddles of the first type being rigidly affixed to, respectively, an uppermost end of each of said single support columns of the side walls of the structure excluding each corner support column;

a plurality of saddles of a second type, said plurality of saddles of the second type being rigidly affixed to, respectively, uppermost ends of each of said abutting pairs of support columns of the side walls of the structure;

a plurality of pre-fabricated wall panel subassemblies, each of said subassemblies comprising a substantially rectangular external frame element, formed of a rigid rectangular tubing material, a major vertical dividing element, at least one horizontal dividing element, and a plurality of sheet-

ing support elements, wherein said external frame element has two vertical sides disposed in a parallel spaced apart relationship so as to be separated by substantially twice said first spacing distance, with an upper end segment and a lower end segment completing said rectangle, said major vertical dividing element being affixed to and extending between said upper and said lower end segments so as to be parallel to and equidistant from said sides, said major vertical dividing element being formed of tubular stock having a rectangular cross-section of the same dimensions as said external frame element, said at least one horizontal dividing element, formed of identical rectangular tubular material as said external frame element, being disposed to extend between and to be affixed to said sides of said external frame element and said major vertical dividing element so as to be parallel with said upper and said lower end segments of said external frame element such that the spacing between the upper end segment of the external frame element and the adjacent horizontal dividing element is substantially identical with the spacing between the lower end segment of the external frame element and the horizontal dividing element proximate thereto and with the spacing between adjacent horizontal dividing elements, said plurality of sheeting support elements being disposed in a vertical orientation between each of said horizontal dividing elements and between said horizontal dividing elements and said upper and said lower end segments of said external frame element, said sheeting support elements being spaced apart in a horizontal direction such that a respective one of said sheeting support elements is in parallel abutting contact with each of said sides of said external frame element, a respective one of said sheeting support elements is in parallel abutting contact with each side of said major vertical dividing element, and remaining sheeting support elements are parallelly spaced apart by substantially equal distances;

a plurality of roof panel subassemblies each roof panel subassembly comprising an external frame element, formed of a substantially rectangular tubular material, having a pair of transverse side members, parallelly spaced apart by substantially twice said first spacing distance, and a pair of longitudinal end members spaced apart by substantially twice said first spacing distance, a major transverse dividing element disposed parallelly equidistant between said transverse side members and rigidly affixed to and extending between said longitudinal end members, a pair of longitudinal dividing elements disposed along a line parallelly equidistant from said longitudinal end members and each rigidly affixed to and extending between one of said transverse side members, respectively, and said major transverse dividing element, and a plurality of sheeting support elements disposed in equidistant spaced apart relationship with each other so as to be parallel with said transverse side members and said major transverse dividing element such that a respective one of said sheeting support elements is in parallelly abutting contact with each of said transverse side members and with each side of said major transverse dividing element, each of said sheeting support elements being rigidly affixed to and extending between said longitudinal end members and said longitudinal dividing elements;

a plurality of truss panel subassemblies of a first type, formed of rectangular tubing material, wherein each truss panel subassembly of the first type comprises a lower horizontal rib element having a horizontal extent substantially equivalent to an integer multiple of wall panel subassembly horizontal widths, a diagonal rib element, rigidly affixed at one end thereof to one end of said lower horizontal rib element, and forming a roof slope angle therewith, a plurality of vertical riser elements, rigidly affixed between said lower horizontal rib element and said diagonal rib element in a spaced apart relationship such that an abutting pair of vertical riser elements are situated at each even multiple of said first spacing distance from the point of intersection of said lower horizontal rib element and said diagonal rib element, and a single vertical riser element is disposed at each odd multiple of said first spacing distance, except that the vertical riser element disposed at the end of said lower horizontal rib element farthest removed from said point of intersection shall be a single vertical riser element, and a plurality of bracing diagonal elements rigidly affixed to each vertical riser element and said lower horizontal rib element at their point of intersection and extending to be rigidly affixed to the next shorter vertical riser element and the diagonal rib element at their point of intersection;

each of said support columns, said saddles of the first and second types, said wall panel subassemblies, said roof panel subassemblies, and said truss panel subassemblies having a plurality of interconnection holes formed therein at predetermined locations;

means for connecting said wall panel subassemblies to respective inwardly adjacent support columns through each vertical side of each external frame element and through each major vertical dividing element of each wall panel subassembly;

means for connecting each wall panel subassembly to the adjoining wall panel subassemblies through the abutting vertical sides of the external frame elements;

means for coupling together pairs of said plurality of truss panel subassemblies of the first type to form a plurality of truss members wherein the longest of the vertical riser elements of each of the pair of truss panel subassemblies of the first type are placed in parallel abutting contact to form a planar triangular truss member such that the lower horizontal rib elements of the pair of truss panel subassemblies of the first type are substantially colinear;

means for coupling said truss members to said saddles of the first and second types such that said truss members span said structure transverse to its extent and are parallelly spaced apart with respect to an end wall of said structure, each of said support columns or pair of support columns and its transversely opposite support column or pair of support columns supporting one of said truss members;

means for connecting said roof panel subassemblies to the diagonal rib elements of said truss members through the transverse side members and the major transverse dividing element of each roof panel subassembly;

means for connecting each of said roof panel subassemblies situated so as to have a longitudinal end member disposed substantially adjacent an upper end segment of the external frame element of a wall panel subassembly, to said wall panel external frame element through said longitudinal end member of the roof panel subassembly and said upper end segment of the wall panel external frame element;

means for connecting each transverse side member of said roof panel frame element to the abutting transverse side members of adjacent roof panel subassemblies;

means for connecting abutting longitudinal end members of adjacent roof panel subassemblies;

a plurality of external wall panel sheeting elements, each of said wall panel sheeting elements being configured as a planar rectangle having dimensions substantially equal to, but less than, the internal distance within a wall panel subassembly separating the surfaces of a vertical side of the external frame element and the major vertical dividing element in a horizontal direction and between adjacent end segments and horizontal dividing elements in a vertical direction;

means for connecting said wall panel sheeting elements to said wall panel subassemblies through said sheeting support elements;

a plurality of roof panel sheeting elements, each of said roof panel sheeting elements being configured as a planar rectangle having dimensions substantially equal to, but less than, the internal distances within a roof panel subassembly separating the surfaces of the external frame element

and the transverse and longitudinal dividing elements of the roof panel subassembly;

means for connecting the roof panel sheeting elements to the roof panel subassemblies through the sheeting support elements; and

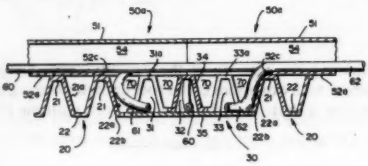
standard roofing materials sufficient to overlay said plurality of roof panel subassemblies.

4,559,749

UNDERFLOOR ASSEMBLY AND CABLE DISTRIBUTION SYSTEM THEREFOR

Arthur Nusbaum, Tenafly, N.J., assignor to Robert Nusbaum; Howard Nusbaum, both of New York, N.Y. and Barbara Selick, Teaneck, N.J.

Filed Jul. 25, 1983, Ser. No. 516,849
Int. Cl.⁴ E04B *5/48*
U.S. Cl. 52—221 **6 Claims**



1. An underfloor assembly for a building comprisng a plurality of elongated, corrugated, metal flooring units and a plurality of elongated, metal, cable distribution ducts arranged side-by-side with said flooring units, said flooring units and said cable distribution ducts being adapted to be supported by the structural beams of the building; and a plurality of spaced-apart elongated cable trenches adapted to carry cables of different types therein and extending over and transversely across said flooring units and said cable distribution ducts; said cable distribution ducts comprising an elongated, longitudinally extending bottom plate, and at least two elongated inverted U-shaped members secured to and longitudinally extending along said bottom plate and defining therewith at least two longitudinally extending closed cell means having top, opposed side and bottom portions for containing and separating cables of different types, one of said inverted U-shaped members being interrupted at intersections of said trenches and said cable distribution ducts such that the top and side portions of a said closed cell are omitted where said closed cell runs under said trench; said trenches comprising an open, longitudinally extending, U-shaped base pan means having a bottom portion and opposed side portions, and cover means removably secured to and closing said open U-shaped base pan means, said bottom portion of said base pan means having apertures therein at said intersections of said trenches and said distribution ducts for permitting direct access from said trench to the distribution duct below.

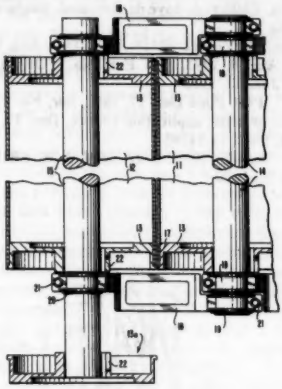
4,559,750

ROOM DIVIDER

Nicolas Scourtelis, Dillstrasse 16, D-2000 Hamburg 13, Fed. Rep. of Germany

Filed Dec. 13, 1983, Ser. No. 561,038
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—238.1 **12 Claims**

1. A room divider composed of individual room divider elements which are adapted to be fastened to one another by means of fastening members, characterized in that each room divider element is made up of tubular hollow members (**11, 12**), a tubular supporting member (**14, 15**) located inside each of said hollow members, and made up of flange members (**13**) which are fastened to the tubular hollow member and the tubular supporting member proximate to the respective ends thereof and in that said fastening members (**18**) consist of two



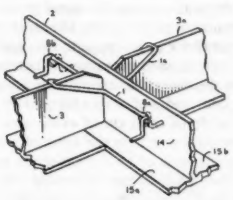
clamp portions (**19, 20**) embracing the supporting members (**14, 15**).

4,559,751

CORROSIVE RESISTANT GRID CONSTRUCTION FOR A SUSPENDED CEILING

David J. Rogers, Brampton, Canada, assignor to Crystaplex Plastics Ltd., Mississauga, Canada

Filed Mar. 1, 1984, Ser. No. 585,043
Int. Cl.⁴ E04C *2/42*
U.S. Cl. 52—665 **20 Claims**



1. For a suspended ceiling assembly comprising a grid of parallel supporting members and cross-members extending between adjacent supporting members, said supporting members having means to support cross-members against movement in one direction, a clamp for joining a cross-member to a supporting member, comprising:

(a) two keepers;

(b) a cross segment;

(c) an intermediate portion resiliently joining said two keepers to said cross segment;

said two keepers being disposed for association with two openings in said supporting member, each opening for receiving a portion of one of said keepers, and a side of said supporting member for abutting another portion of each of said keepers so that movement of said cross segment in a direction opposite said one direction stresses said clamp;

said cross segment for moving in said direction opposite said one direction when said keepers are associated with said two openings in said supporting member and said side of said supporting member and for abutting said cross-member opposite said means to supporting order to urge said cross-member against said means to support.

4,559,752

BUILDING CONSTRUCTION PANEL WITH INTERNAL METALLIC REINFORCEMENT

Joseph A. Kieffer, Abbaye de Roseland, Baccara 3, 06200 -Nice, France

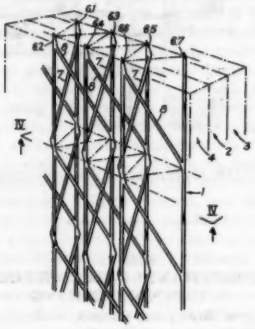
PCT No. PCT/FR82/00214, § 371 Date Aug. 8, 1983, § 102(e) Date Aug. 8, 1983, PCT Pub. No. WO83/02129, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 17, 1982, Ser. No. 530,593

Claims priority, application France, Dec. 17, 1981, 81 23618; Aug. 18, 1982, 82 14293

Int. Cl.⁴ E04C *2/42, 5/04, 1/00;* E04B *5/04*

U.S. Cl. 52—670 6 Claims



1. A three-dimensional monolithic structure of expanded metal formed from an expandable metal plane sheet usable in a building construction panel or the like, said structure exhibiting mutually parallel ribs at opposite first and second faces of the structure and inclined cross-struts formed by interrupted cutting lines in the sheet, the cross-struts inwardly joining the ribs at shaped joint nodes of shapes formed by the cutting lines, wherein each node of each rib of even rank which defines a first face of the structure is in the form of a triangle and connects the adjacent ends of two cross-struts extending respectively on the two sides of the associated rib and in the same direction, and the directions being reversed for the cross-struts of the two consecutive ribs of even rank, and each node of each rib of odd rank which defines the second face of the structure being in the form of a parallelogram and connects to the adjacent ends of two cross-struts extending respectively on the two sides of the associated rib and in opposite directions, and the directions being reversed for the homologous cross-struts of two consecutive ribs of odd rank.

4,559,753

METHOD OF INSTALLING A PREFABRICATED CURB UNIT TO A STANDING SEAM ROOF

Ralph H. Brueske, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Division of Ser. No. 431,046, Sep. 30, 1982. This application Feb. 22, 1985, Ser. No. 704,517

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—748 9 Claims

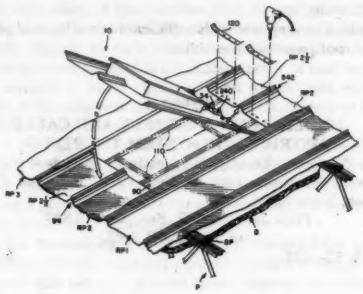
1. A method of installing a roof curb with a roof having standing seams between adjacent roof panels comprising:

installing a plurality of roof panels having edges arranged for interlocking by seaming;

seaming interlocked edges of said roof panels over most of the roof except for the edges adjacent an area to be cut out;

cutting an opening at said area;

installing a roof curb peripheral extensions therewith into said opening; and



completing the seaming of the partially seamed edges together with extensions of the roof curb for forming a solid, secure, watertight seal of the roof curb with the roof.

4,559,754

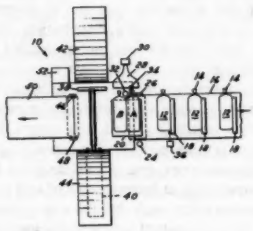
INSPECTION AND REJECTION APPARATUS

Forrest C. Bacon, Inver Grove Heights, Minn., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jan. 14, 1985, Ser. No. 691,100

Int. Cl.⁴ B07C *5/02*

U.S. Cl. 53—53 5 Claims



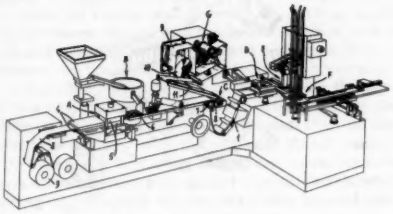
1. An inspection and rejection mechanism comprising a conveyor having equally spaced flight bars secured thereon for carrying loaves of bread, each intended to have a wrapper with one tied end thereon, a plate member mounted with its front edge at the discharge end of said conveyor and having a width suitable for first and second loaf positions, a vacuum head mounted adjacent one side edge of said flat plate for pulling each tied end into an elongated shape, a reciprocally mounted pusher plate mounted on a table just beyond the back edge of said plate member, a chute mounted on at least one side of said table, switch means mounted adjacent the front edge of said plate member for indicating the passage therepast of successive loaves, and a photo-electric unit mounted between the vacuum head and said side edge of said plate member at the midpoint therealong, said photo-electric unit serving, if not broken, to indicate the absence of a tied end moving from the first position to the second position on said plate member, and if the break is prolonged after a loaf passes from the first to the second position, to indicate that the end is not tied or that two adjacent ends are tied together, and, hence, to signal said pusher plate to move across said table to reject two loaves into said chute.

4,559,755

DEVICE FOR FLEXOGRAPHIC PRINTING ON A STRIP OF PACKING MATERIAL IN PACKAGING MACHINES, PARTICULARLY FOR BLISTER PACKS

Andrea Romagnoli, Bologna, Italy, assignor to IMA Industria Macchine Automatiche SpA, Bologna, Italy

Filed Feb. 1, 1984, Ser. No. 575,940
Claims priority, application Italy, Feb. 23, 1983, 3347 A/83
Int. Cl.[4] B65B *61/02*
U.S. Cl. 53—64 3 Claims



1. A device for flexographic printing on a continuous strip of packaging material in a packaging machine, said device comprising:

a flexographic printing block roll carrying a flexographic printing block in the form of an element of resilient material in plate form having on one of its faces all patterns to be printed and on its opposite face an adhesive for detachable application to said printing block roll;

an ink tray juxtaposed with said printing block roll;

at least one ink transfer roller mounted on said tray and rotatable for transferring ink to said printing block roll;

displacing means for movable supporting said tray relative to said printing block roll for shifting of said tray and said ink transfer roller away from said printing block roll;

control means responsive to the stopping of said packaging machine for activating said displacing means;

a pressure roll adapted to hold said strip against said printing block roll when said packaging machine is operating;

means connected to said control means for relatively spacing said pressure roll from said printing block roll when said packaging machine is inoperative; and

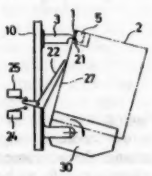
means effective upon interruption of operation of said machine for continuing to drive said printing block roll and said ink transfer roller.

4,559,756

APPARATUS FOR PACKING POWDERED MATERIALS INTO SACK HAVING SEALING MEMBER

Shigeo Nakajima, Kyoto, Japan, assignor to Nakajima Seisakusho Co., Ltd., Japan

Division of Ser. No. 458,980, Jan. 18, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,898
Claims priority, application Japan, Jan. 30, 1982, 57-013959
Int. Cl.[4] B65B *1/30, 7/06*
U.S. Cl. 53—75 2 Claims



1. An apparatus for packing powdered materials into a sack having a sealing member defining an aperture, comprising:

a frame for the apparatus having upper and lower portions;

a supply pipe assembly, mounted to the upper portion of the frame and adapted to be at least partially inserted into the aperture of the sack, for supplying powdered material therethrough into the interior of the sack, the supply pipe assembly having a substantially cylindrical body portion, a curved head adjacent the body portion adapted for insertion into the aperture of the sealing member, an expansible tube mounted on the body portion for shutting the space between the body portion and the sealing member, a port in the front end of the head through which powdered material is supplied to the sack, and a nozzle detachably mounted to and projecting from the front end of the head which is provided with a plurality of fine holes through which fluid is jetted to produce an adhesion on the sealing member when the nozzle is within the sealing member;

a supporting member for supporting the sack, mounted to the lower portion of the frame and selectively pivotable between a substantially horizontal position wherein powdered material is supplied to the sack, and a forward inclined position which is assumed after the supplying of powdered material to the sack is complete,

detecting means for detecting the installation of the sack upon the supply pipe assembly to thereby initiate the supplying of powdered material to the sack, and for detecting a predetermined inclination of the sack after a predetermined amount of powdered materials have been supplied to the sack to thereby initiate sealing of the sack, said detecting means including a first switch and a bent lever having first and second arm portions, the lever being pivotably mounted on the frame and movable between a first position wherein the first arm portion contacts the sack when the sack is in a first position relative to the supply pipe assembly and is ready to receive powdered material, and a second position wherein the first arm portion contacts the sack when the sack is in a second position relative to the supply pipe assembly such that the sealing member is ready to receive fluid jetted from the nozzle and the second arm portion operates the first switch, thereby initiating jetting of the fluid; and

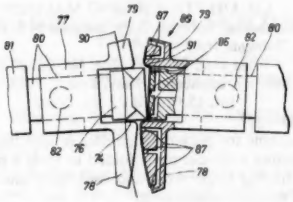
adjuster means for limiting the movement of the second arm portion, thereby controlling when the second arm portion operates the first switch.

4,559,757

CIGARETTE PACKAGING APPARATUS WITH TANGENTIAL TRANSFER

Heinz H. Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Division of Ser. No. 210,186, Nov. 25, 1980, Pat. No. 4,428,177. This application Sep. 7, 1983, Ser. No. 530,172
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1979, 2949252
Int. Cl.[4] B65B *19/22*
U.S. Cl. 53—176 5 Claims



1. An apparatus for packaging rod-shaped objects such as cigarettes into quadratic packs having relatively wide width

front and rear faces and relatively narrow width side and end faces, comprising:

(a) first, second and third continuously driven, rotary revolvers (66, 67, 68) having parallel axes,

(b) said revolvers being sequentially arranged in tangential interface to define first and second transfer stations (73, 89) between the first and second and between the second and third revolvers,

(c) a plurality of circumferentially spaced, three-sided pockets (71, 74, 91) defined in the outer periphery of each revolver, each pocket being dimensioned to closely accommodate a group (23) of cigarettes arranged in pack form with the cigarette axes parallel to the revolver axes and with the depth of each pocket substantially corresponding to the narrow width of a side face of a pack,

(d) supply magazine means (35) for individually feeding groups of unwrapped cigarettes into the pockets of the first revolver,

(e) means (84) adjacent the second revolver upstream from the first transfer station for individually applying inner metallic foil blanks (21) across mouths of the pockets of the second revolver,

(f) stripper means (94) disposed at the first transfer station for tangentially guiding unwrapped cigarette groups from pockets of the first revolver into facing foil blank covered pockets of the second revolver while said revolvers are moving,

(g) means disposed adjacent the outer periphery of the second revolver and between the first and second transfer stations for folding the foil blanks around the cigarette groups,

(h) means adjacent the third revolver upstream from the second transfer station for individually applying outer paper blanks (22) across mouths of the pockets of the third revolver, and

(i) means for simultaneously decreasing the radial depth of pockets of the second revolver as they pass through the second transfer station and increasing the radial depth of pockets of the third revolver to tangentially transfer foil wrapped packs from pockets of the second revolver into facing paper blank covered pockets of the third revolver while said revolvers are moving, each of said second and third revolver pockets having a radially stationary bottom (76) and radially movable side walls (77), means to respectively retract and extend said side walls in synchronism at the second transfer station such that the pocket bottoms maintain a same relative spacing at the second transfer station corresponding to the width of a side face of a pack to thereby simultaneously engage both front and rear pack faces during transfer to tangentially transfer said pack without substantial radial movement of the pack during transfer,

(j) the first and third revolvers rotating in the same direction and the second revolver rotating in an opposite direction such that the cigarette groups and packs follow a sinuous path with substantially no radial movement to thereby enable a smooth and more rapid transfer.

4,559,758

CIGARETTE PACKING MACHINE

Antonio Gamberini, Bologna, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed Dec. 21, 1983, Ser. No. 563,819

Claims priority, application Italy, Feb. 8, 1983, 3332 A/83

Int. Cl.⁴ B65B *11/28, 19/02*

U.S. Cl. 53—207 **8 Claims**

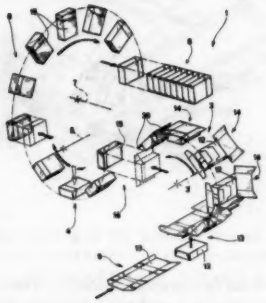
1. A machine for packing cigarettes is hard fliptop packets, each including a die-cut piece folded to form a parallelepipedon case having larger front and back faces and smaller side faces; the machine comprising:

a rotary folding wheel mounted for rotation about a horizontal axis and for folding in succession said diecut pieces about respective groups of cigarettes to form said packets;

an output unit;

transfer means to push in succession each said packet off said folding wheel in a radial outwards sense which is perpendicular to said larger front and back faces of said packet, and to transfer said packet to said output unit;

said output unit comprising means for drying said packets, means for rejecting those of said packets which are faulty, and an output conveyor; and



said drying and said rejecting means comprising at least one rotary conveyor wheel substantially tangent, in a radial direction, to the periphery of said folding wheel, and mounted for rotation about a substantially horizontal axis to convey each said packet towards said output conveyor in a direction substantially perpendicular to said smaller side faces of the packet itself.

4,559,759

CAPPING MACHINES FOR CONTAINERS

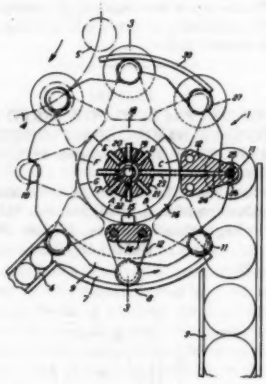
James F. Herbert, Staffordshire, England, assignor to Metal Closures Limited, West Midlands, England

Filed Oct. 13, 1983, Ser. No. 541,535

Claims priority, application United Kingdom, Oct. 18, 1982, 8229676

Int. Cl.⁴ B67B *3/20, 1/06*

U.S. Cl. 53—308 **9 Claims**



1. A device for placing internally screw-threaded closure caps on externally screw-threaded containers and engaging said caps with the container thread comprising a feed chute for such closure caps, a closure cap feedwheel mounted for rotation about a vertical axis and having recesses spaced apart along its periphery and arranged to withdraw closure caps sequentially from said feed chute and to drive the caps in a

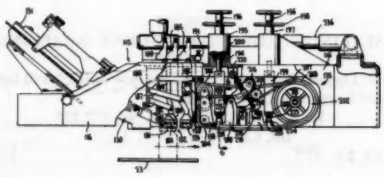
horizontal part-circular path in spaced relation to one another, a series of pick-up members mounted for movement in a circular path coaxial with said part-circular path and being respectively mounted in axial alignment with said recesses each of which pick-up members is rotatable about and vertically movable in relation to its own axis which axis is parallel to said vertical axis, each of said pick-up members being adapted to pick-up a container cap from the associated aligned recess in the feedwheel and to hold such cap in a substantially horizontal position, a rotary drive wheel arranged to drive a series of spaced containers in an arc with the axis of each container substantially aligned with the axis of one of said pick-up members, means for raising and lowering the pick-up members during movement thereof with the feedwheel about said vertical axis and arranged for lowering each pick-up, member onto a container cap travelling in said part-circular horizontal path after withdrawal from said feed chute, carrying the cap forward to a position over a container, lowering the cap onto a container at a closure application station end, after the closure cap has been engaged with the container thread, raising the pick-up member to its starting height, and means for rotating the pick-up members and the closure caps carried thereby in a tightening direction after the caps have been lowered onto the containers.

4,559,760

UNIVERSAL CAPPING MACHINE

Ben G. Daniels, Elmhurst; Nicholas E. Hall; Daniel F. Naples, both of Tinley Park, and Albert C. Schnell, Hickory Hills, all of Ill., assignors to Continental White Cap, Inc., Northbrook, Ill.

Filed Nov. 2, 1982, Ser. No. 438,426
Int. Cl.[4] B67B *3/20*; B65B *7/28*
U.S. Cl. 53—314 **4 Claims**



1. A universal capper for applying caps to containers, said capper comprising a base, an endless conveyor carried by said base and having a container supporting run at a fixed elevation, a first support, first mounting means mounting said first support for vertical adjustment relative to said base, container retaining belt means carried by said first support on opposite sides of a longitudinal center line of container passage through said machine, a capper head, second mounting means mounting said capper head for vertical movement relative to said base, a second support, mounting means mounting said second support on said capper head for vertical adjustment both with and with respect to said capper head, closure rotating belts carried by said second support on opposite sides of said center line, a third support carried by said capper head for vertical adjustment therewith relative to said base, closure guide chute elements carried by said third support on opposite sides of said center line, and adjusting means for separately adjusting the spacing of said container retaining belts, said closure guide chute elements and pressure areas of said closure rotating belts and for separately vertically adjusting the height of said first, second and third supports and said capper head while said capper is operating, said first mounting means including four rectangularly arranged column type supports between said base and said first support, a threaded shaft and nut arrangement within each column type support between said base and said first support, and drive means connected to said threaded shaft and nut arrangement for actuating the same in unison to vertically adjust the elevation of said first support and thus said container retaining belts while said capper is in operation, each of said container retaining belts having a drive including a rotatable drive element fixed relative to said first support for rotation, said container retaining belts having opposed runs for engaging containers, and adjustable belt positioning shoes engaging said container retaining belts and determining the transverse positions of said opposed runs to accommodate containers of different diameters.

4,559,761

METHOD FOR TRANSPORTING INSULATION TO A WORK AREA

William H. Kumm, and John H. Kumm, both of 511 Heavitree La., Severna Park, Md. 21146

Continuation of Ser. No. 169,035, Jul. 15, 1980, abandoned. This application Feb. 23, 1983, Ser. No. 468,963
Int. Cl.[4] B65B *9/06, 11/48*
U.S. Cl. 53—397 **3 Claims**

1. A method of transporting building type insulation from a work area through a small opening within a building to be insulated which comprises:

laying a sheet of re-usable flexible material upon a surface said sheet having means for closing said flexible material along its linear edges and being of a width and length which is greater than the width and length of the insulation to be transported;

laying a roll of insulation upon said sheet of flexible material and unrolling the insulation with its longitudinal axis parallel with the longitudinal axis of said sheet of flexible material and the ends of the insulation spaced inwardly from the ends of the sheet;

rolling said sheet of flexible material and said insulation together along their longitudinal axis and securing said sheet of flexible material in its rolled condition, thereby enclosing said insulation within the confines of said sheet of flexible material;

passing said rolled sheet of flexible material with said insulation therein through said small opening in said building to the area to be insulated;

opening said rolled sheet of flexible material; and

removing said insulation from said unrolled sheet of flexible material and reloading the removed unrolled sheet of re-usable flexible material with one or more unrolled lengths of insulation.

4,559,762

METHOD FOR LOADING ELECTRON TUBES IN PACKAGES

Michael Soltus, Forest City, and James G. Reese, Jr., Clarks Summit, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 22, 1983, Ser. No. 525,420
Int. Cl.[4] B65B *23/22, 5/08, 5/10*
U.S. Cl. 53—441 **11 Claims**

1. A method for loading electron tubes in a package containing m tubes wherein m is at least 4, said method including

(a) providing a base platform having m nests therein for receiving said m tubes in a radial array about a center with all of the bases of said tubes facing inwardly towards said

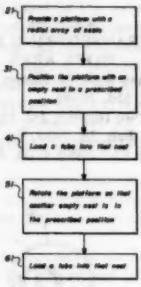
center, each of said nests for holding less than half the height of said tubes,

(b) positioning said base platform with an empty one of said nests in a prescribed position,

(c) loading an electron tube into said one nest,

(d) rotating said base platform about said center to position another empty one of said nests in said prescribed position,

(e) loading another electron tube into said another one of said nests,



(f) repeating steps (d) and (e) until all of said nests are filled,

(g) providing a cover platform having m recesses therein substantially complementary to said m nests in said base platform, and

(h) positioning said cover platform over said loaded tubes with less than half the height of each tube within one of said recesses, said cover platform being spaced from said base platform by said loaded tubes.

4,559,763

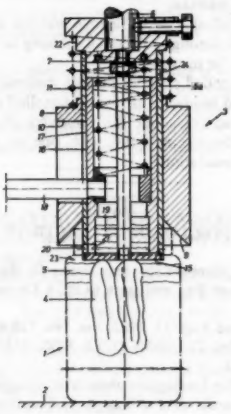
DEVICE FOR PRESSING DOWN PRODUCT IN FILLED CONTAINERS WITH OPEN TOPS WHICH CAN BE MOVED CONTINUOUSLY AND WITH PREDETERMINED SPACING

Günter Bode, Brockenblick 8, 3341 Ohrum; Horst Meier, Bevenroder Str. 5, 3300 Braunschweig, Fed. Rep. of Germany, and Manfred Engler, CArl-Zeiss-Strasse 10, 7100 Heilbronn-Kirchhausen, all of Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,874

Int. Cl.⁴ B65B *1/24*

U.S. Cl. 53—527 **5 Claims**



1. Apparatus for forcing fill-goods into open top containers filled with fill-goods of the type including solids and wherein each container has a rim defining an open mouth with said solids projecting at least axially beyond said rim, conveyor means for continuously moving said filled containers generally at predetermined spacing along a preselected path, said apparatus comprising a pushrod lowered and raised synchronously with the movement of the containers past said apparatus, a tamper head fixedly secured to said pushrod for movement with said pushrod into and out of mouths of said containers, and a squeeze-off component carried by said pushrod for axial movement relative to said pushrod and against a prestressed spring action for seating on container rims when said pushrod is lowered; said squeeze-off component being in the form of a hood extending axially below and circumferentially surrounding said tamper head when said apparatus is in a rest position with said pushrod raised, said hood having a lower centering surface flaring in a downward direction for engagement with a container before said tamper head enters the container, the projection of said hood below said tamper head being such that said centering surface will engage the container rim to center the container before the tamper head engages fill-goods projecting out of said container, said center surface on said hood having sealing means for forming a liquid tight seal with a container rim, said tamper head having an interior defining a collecting vessel for excess fill-goods liquid, said tamper head having intake aperture means in a lower part thereof for receiving and trapping liquid when said tamper head is within a container, said intake aperture means including relatively rotatable members each having an aperture therethrough with said apertures being aligned in first positions of said members and misaligned in closing relation in a second position of said members.

4,559,764

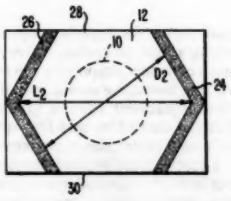
SEALING BLADES FOR A SHRINK WRAPPING PROCESS

John V. Liggett, Plymouth, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,275

Int. Cl.⁴ B65B *51/14, 51/30*

U.S. Cl. 53—557 **1 Claim**



1. Improved sets of sealing blades for a shrink wrapping process of the type wherein a plurality of objects are advanced in spaced relationship along with and between two long sheets of heat-shrinkable polyethylene, a first of said sets and a second of said sets of said sealing blades respectively join said two sheets at a trailing side of one of said objects and at a leading side of an adjacent said object, and said two sheets are cut by a cutting blade between said first set of sealing blades and said second set of sealing blades to temporarily retain each of said objects between said two sheets prior to said polyethylene being heated to cause shrinkage thereof for sealing said object with said polyethylene wherein said improvement comprises:

said first set of said sealing blades having mating V-shaped sealing surfaces with bases thereof adjacent said cutting blades and legs thereof extending toward opposite sides of said object;

said second set of said seaing blades having mating V-shaped sealing surfaces with bases thereof adjacent said cutting blade and legs thereof extending toward opposite sides of said adjacent object; and

the first and second sets of sealing blades being disposed to form oppositely directed V-shaped seals on the leading and trailing sides of each object for encircling same.

4,559,765

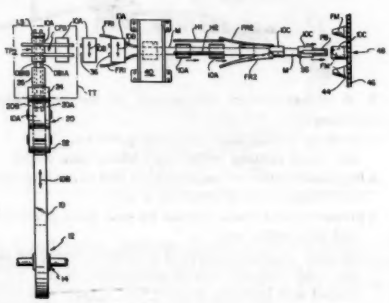
APPARATUS FOR MANUFACTURING FOAM PLASTIC CONTAINERS BY USE OF A TUBULAR FORMING MANDREL

Allan K. Cress, Baltimore, and Charles E. Busse, Jarrettsville, both of Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 169,896, Jul. 17, 1980, Pat. No. 4,365,460, which is a continuation of Ser. No. 899,848, Apr. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 665,617, Mar. 10, 1976, Pat. No. 4,121,402. This application Jul. 6, 1982, Ser. No. 395,469

Int. Cl.⁴ B65B *43/08, 3/02*

U.S. Cl. 53—557 **28 Claims**



1. An apparatus for forming a cylindrical blank from a rectangular blank of foam sheet material comprising:

a delivery means for supplying a rectangular blank including two transverse edges and two parallel edges to a rectangular blank infeed point;

a transfer means for receiving and positioning said rectangular blank at said infeed point;

a mandrel means for forming a cylindrical blank positioned adjacent the transfer receiving means and extending from said rectangular blank infeed point to a cylindrical blank discharge point;

a conveyor means for transporting said rectangular blank along said mandrel means in a direction parallel to said parallel edges of said rectangular blank;

a folding means for shaping said rectangular blank positioned adjacent said mandrel means, said folding means progressively folding said rectangular blank around said mandrel means from said infeed point to said discharge point to overlap said parallel edges of said rectangular blank on said mandrel to form a cylindrical blank;

a heating means for applying heat to said parallel edges of said rectangular blank;

a seaming means for applying pressure to said heated parallel edges of said cylindrical blank to affix said parallel edges of said cylindrical blank together and transporting said cylindrical blank along said mandrel, out of engagement with said conveyor means at a reduced diameter portion of said mandrel and producing the momentum necessary to position said cylindrical blank on a final forming mandrel;

a seating means for engaging said cylindrical blank positioned on a final forming mandrel to ensure proper positioning thereof; and

said final forming mandrel is transported along a path and said seating means includes an endless belt positioned adjacent said path for engaging said cylindrical blank positioned on a final forming mandrel.

4,559,766

DEVICE FOR AUTOMATIC TYING OF PACKAGES

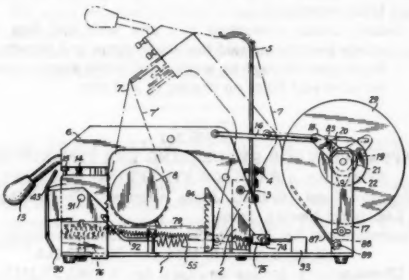
Hidekatsu Matsushita, Kyoto, Japan, assignor to Matsushita Seiki Kabushiki Kaisha, Kyoto, Japan and Clements Industries, Inc., Hackensack, N.J.

Filed Jan. 27, 1982, Ser. No. 343,086

Claims priority, application Japan, Jan. 29, 1981, 56-12070

Int. Cl.⁴ B65B *13/00*

U.S. Cl. 53—586 **15 Claims**



1. A binding device for tying a binding material, hereinafter referred to as a tape, about a package or other object, said tape having the characteristic of retaining a twisted shape on being bent or twisted into same, said device comprising:

(a) a frame;

(b) a movable arm hinged to said frame and movable between open and closed positions relative to said frame;

(c) package-support means on said frame, said arm being shaped to permit positioning of material to be tied on said package-support means when said arm is in said open position;

(d) tape-drawing means for drawing tape from a reel to a package positioned in said device for being tied, said arm being constructed and arranged for winding said tape around said package by the opening and closing of same;

(e) tape-cutting means on said frame for cutting said tape after said tape is wound about said material, thereby forming a cutoff portion of said tape having two ends and a reel-tape end connected with said reel;

(f) twisting means on said frame for twisting said ends of said cut-off portion sufficiently so that they form a knot, said arm further being arranged and constructed for operating said tapedrawing means, said tape-cutting means and said twisting means in proper sequence by opening and closing of same; wherein said twisting means comprises:

a first shaft mounted on said frame;

a smaller gear and a rotary head mounted at opposite ends of said shaft for rotation together;

a second shaft mounted on said frame;

a larger gear having inner and outer faces relative to said frame, said larger gear being mounted on said second shaft and meshing with said smaller gear for driving same, said second shaft having an outer end and an inner end relative to said frame; said larger gear having holes therethrough from said outer face to said inner face, said holes being spaced at equal angular distances and at equal distances from the axis of said second shaft;

retractable holding means associated with said frame for

cooperating with one of said holes and holding said larger gear stationary during opening of said arm;

first lever means mounted on the outer end of said second shaft, said larger gear being mounted adjacent said first lever means;

retractable coupling means associated with said first lever means for fixing said lever means to said larger gear by means of said one of said holes, said retractable holding means being disposed for barring access to said one of said holes by said retractable coupling means when said arm is in open position;

second lever means mounted for rotation to said frame;

push-bolt means disposed on said arm for rotating said second lever means during the closing of said arm, said second lever means engaging said retractable holding means for retracting same from said one of said holes on rotation of said second lever means by said push-bolt means and thereby permitting coupling of said larger gear to said first lever means; and

linking means connecting said arm with said first lever means for rotating said first lever means and thereby said larger gear through an angle equal to the angular spacing between said holes on closing of said arm.

4,559,767

APPARATUS FOR REGULATING THE TENSION OF A STRAP IN A PACKAGE STRAPPING MACHINE

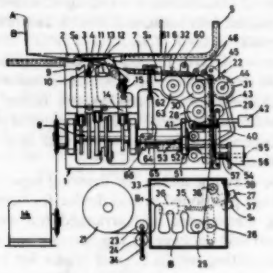
Masaho Takami, Hirakata, Japan, assignor to Shoko Kiko Co., Ltd., Shijo Nawate, Japan

Continuation of Ser. No. 456,290, Jan. 6, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 672,165

Claims priority, application Japan, Jan. 8, 1982, 57-2115; Jan. 13, 1982, 57-5304

Int. Cl.⁴ B65B *13/04, 13/22*

U.S. Cl. 53—589 **2 Claims**



1. An apparatus for regulating the tension of a strap wound around a package on a package strapping machine, said apparatus comprising:

a frame having a package support surface provided with a strap guiding frame into which the package is inserted and into which the strap is fed to form a strap loop around the package;

a driving roller rotatably mounted on said frame below said package support surface for bearing against the strap and rotatable in a direction for tensioning the strap to tighten the strap around the inserted package;

a press roller movable toward and away from said driving roller for holding the strap in driving engagement against said driving roller or releasing it from such driving engagement;

adjusting means connected to said press roller for adjusting the pressure of said press roller on said driving roller;

a strap conduit pivotally mounted on said frame for passing the strap from said driving roller to said strap guiding frame;

link means movably mounted on said frame below said strap conduit;

a spring having one end secured to said strap conduit and the other end secured to said link means; and

a rod connecting said link means to said adjusting means and movable by said adjusting means for changing the tension of said spring when said adjusting means is actuated for adjusting the pressure applied by said press roller to said driving roller.

4,559,768

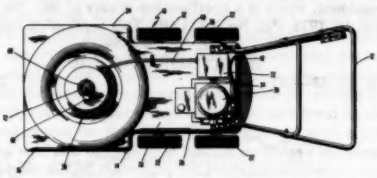
POWER-DRIVEN LAWNMOWER

Robert M. Dunn, 506 Queen St., Alexandria, Va. 22314

Filed May 25, 1984, Ser. No. 614,227

Int. Cl.⁴ A01D *34/03, 35/262, 55/32*

U.S. Cl. 56—16.9 **29 Claims**



1. A power-driven lawnmower of the walk-behind type comprising:

a housing having front and rear portions,

said front portion including vertical side walls,

a handle mounted on said housing and extending rearwardly therefrom to be gripped by a user,

a power-driven blade carried by said front portion between said side walls, and

a plurality of ground support wheels mounted on said housing, said support wheels comprising a pair of laterally spaced and laterally aligned first wheels and at least one additional wheel spaced in a fore-aft direction from said first wheels, all of said first and second wheels being located on said rear portion behind said blade and being laterally offset inwardly relative to said side walls so that no portion of said first and second wheels extends laterally outwardly beyond said side walls or forwardly beyond said blade, in order to enable said front portion to closely approach upstanding objects.

4,559,769

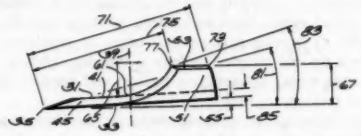
CUTTER BLADE FOR PNEUMATICALLY TRANSPORTING GRASS CLIPPINGS

Carl E. Seyerle, Abingdon, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 26, 1982, Ser. No. 402,102

Int. Cl.⁴ A01D *55/18*

U.S. Cl. 56—295 **18 Claims**



1. A cutter blade for a rotary lawn mower, said cutter blade being generally of elongated rectangular outline and including a leading edge, a trailing edge, a longitudinal axis extending lengthwise between said leading and trailing edges, a generally planar outer end portion including a cutting edge forming a part of said leading edge and an outer tip which travels at a

speed between 14,000 fpm and 19,000 fpm when rotated by the lawn mower, and a sail portion extending from said outer end portion along a form line extending from said outer tip to said trailing edge at a form angle within the range of 25 degrees to 35 degrees to said longitudinal axis, said sail portion having an upper edge spaced above a horizontal plane including said cutting edge at a height of between 0.65 inches and 0.75 inches, and said sail portion extending continuously concavely arcuately outwardly and upwardly from said form line.

4,559,770

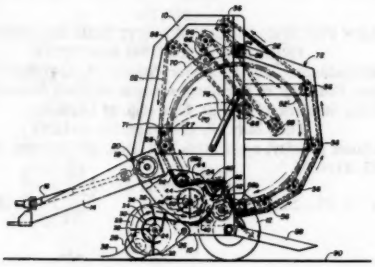
ROUND BALER WITH DUAL FUNCTION FINGER DRUM

Aquila D. Mast, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Continuation-in-part of Ser. No. 497,932, May 25, 1983, Pat. No. 4,470,247. This application Mar. 27, 1984, Ser. No. 594,002

Int. Cl.⁴ A01D *89/00, 59/00*

U.S. Cl. 56—341 **4 Claims**



1. In a roll baling machine having a mobile frame, bale forming means supported on said mobile frame, pickup means supported on said mobile frame for engaging and picking up crop material, the improvement comprising:

a finger drum for moving crop material from said pickup means toward said bale forming means and for assisting in supporting a roll bale during formation thereof by said bale forming means;

said finger drum including a cylinder and a plurality of fingers movable between fully projected positions extending from said cylinder and fully retracted positions within said cylinder; and

said fingers being in said fully projected positions when they are adjacent said pickup means to thereby take crop material from said pickup means and move it toward said bale forming means, and said fingers being in said fully retracted positions when they are adjacent a point on said cylinder where the roll bale contacts said cylinder to thereby prevent said fingers from penetrating the outer surface of the roll bale.

4,559,771

MANUFACTURE OF TELECOMMUNICATIONS CABLE CORE UNITS

John N. Garner, Kingston, and Philip A. McGettigan, Montreal, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 3, 1984, Ser. No. 637,592

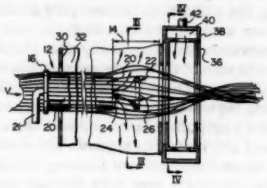
Int. Cl.⁴ H01B *13/04*

U.S. Cl. 57—6 **32 Claims**

1. Apparatus for forming a core unit from telecommunications conductor units each formed from twisted together insulated conductors and in which the relative positions of the conductor units are changed along the core unit, the apparatus comprising in order, downstream along a feedpath for the units:-

means to guide conductor units in the form of an array in a cross-section transverse to the feedpath;

means to introduce a flow of air through the array at an airflow station spaced downstream from the array guide means so as to cause relative sideways movement of the



conductor units and continual change in their positions in the array relative to their positions at the array guide means; and

a core unit forming and take-up means to draw the conductor units together to form the core unit.

4,559,772

FALSE TWIST TEXTURIZED YARN, AND A PROCESS FOR ITS PREPARATION

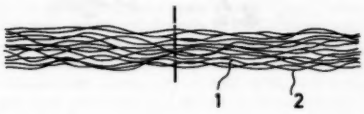
Karl Heinrich, Grossaitingen; Norbert Heichlinger, Königsbrunn, and Adolf Donig, Bobingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 464,037

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205188

Int. Cl.⁴ D02G *3/26, 1/02*

U.S. Cl. 57—247 **14 Claims**



1. A false twist texturized yarn from two yarn components of synthetic filaments which differ in their twist tendency, comprising that the filaments of one component have a reduced crimp contraction which is less than 10% and the filaments of the other yarn component have a crimp contraction greater than 30%.

4,559,773

METHOD AND APPARATUS FOR RESTARTING A YARN SPINNING APPARATUS

Peter H. Stahlecker, 7608 Antlers La., #4, Charlotte, N.C. 28210

Filed Jan. 13, 1984, Ser. No. 570,550

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301074

Int. Cl.⁴ D01H *15/00, 11/00*

U.S. Cl. 57—261 **12 Claims**

1. In a yarn spinning process wherein a fiber material is supplied to a spinning means and a spun yarn is advanced from said spinning means onto a rotating take-up package, a method for restarting the spinning of the yarn following a yarn break, and wherein the resulting finished yarn has a high quality interconnection, and comprising the steps of

terminating the supply of said fiber material and the rotation of the take-up package,

withdrawing the finished yarn end extending from the take-up package and threading the same through a yarn inter-

connecting means, and returning the same to said spinning means,

piecing-up the withdrawn finished yarn end by restarting the supply of said fiber material and forming a piece-up segment, to produce a newly spun yarn which contains the pieced-up segment,

severing the withdrawn finished yarn at a location between the yarn interconnecting means and said spinning means either prior to or immediately after the above piecing-up step, and so that the newly spun yarn which contains the pieced-up segment defines a severed leading end,

advancing the newly spun yarn while accumulating the same in a first yarn accumulator, and so that the severed leading end and the pieced-up segment are received in the first yarn accumulator without forming a loop,

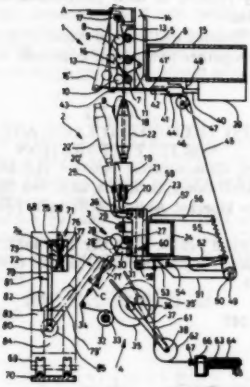
threading the newly spun yarn through the yarn interconnecting means and while continuing to advance the newly spun yarn and accumulate the same in said first yarn accumulator, then

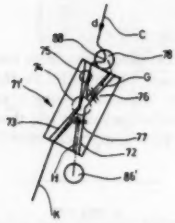
momentarily holding the newly spun yarn in the yarn interconnecting means and actuating the yarn interconnecting means to interconnect the same with the withdrawn finished yarn previously threaded through the yarn interconnecting means and to thereby form a high quality interconnection, while continuing to advance the newly spun yarn and while accumulating the same in a second separate auxiliary yarn accumulator disposed upstream of the yarn interconnecting means, and

severing the yarn disposed in the first yarn accumulator and which includes the severed leading end and the pieced-up segment, and then

winding the resulting finished yarn upon the take-up package, and so as to withdraw the yarn accumulated in said auxiliary accumulator,

whereby the pieced-up segment is removed and replaced with a high quality yarn interconnection without interruption of the advance of the newly spun yarn.





4,559,774

YARN PIECING ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

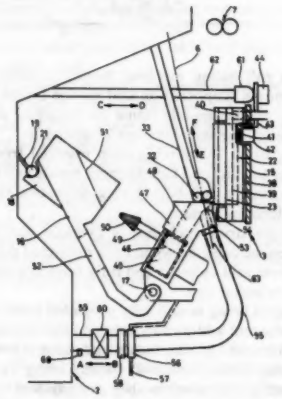
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,087

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318266

Int. Cl.⁴ D01H *15/02*

U.S. Cl. 57—263 **28 Claims**



1. A yarn piecing process for piecing a spun yarn end section with fibers being spun in an open-end friction spinning machine of the type having:

two friction rollers rotatably drivable in the direction and disposed adjacent one another to form a yarn forming wedge-shaped gap therebetween,

fiber supplying means for supplying individual fibers to the wedge shaped gap,

suction device means for applying suction forces to hold the spinning yarn in the wedge shaped gap,

and yarn withdrawing means for withdrawing formed yarn from the wedge-shaped gap, said process comprising:

stopping the rotation of the friction rollers,

placing the spun yarn end suction in the wedge shaped gap of the stopped rollers, and

subsequently switching on the drive for the friction rollers, the fiber supplying means, and the yarn withdrawing means.

4,559,775

FRICTION YARN FALSE TWISTING APPARATUS

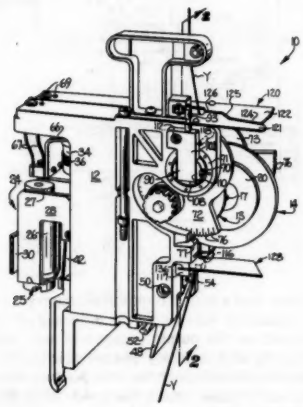
Detlev Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 272,940, Jun. 12, 1981, Pat. No. 4,372,106, and a continuation-in-part of Ser. No. 273,076, Jun. 12, 1981, Pat. No. 4,389,841, and a continuation-in-part of Ser. No. 429,796, Sep. 30, 1982, Pat. No. 4,486,762. This application Jan. 21, 1983, Ser. No. 459,992

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Jul. 9, 1980, 3025921; Dec. 23, 1980, 3048615; Jun. 5, 1982, 3221352; Jul. 24, 1982, 3227711; Sep. 10, 1982, 3233624

Int. Cl.[4] D02G *1/08*

U.S. Cl. 57—340 10 Claims



1. A yarn false twisting apparatus comprising

a frame,

a pair of twist imparting members, each having a generally flat yarn engaging friction surface,

means mounting said members to said frame for rotational movement wherein portions of the respective yarn engaging friction surfaces are disposed in opposing relationship and define a twisting zone therebetween,

drive means for operatively rotating each of said members, and such that a yarn may be advanced along a path of travel through said twisting zone while having twist imparted thereto, said drive means including

(a) a drive whorl rotatably mounted in a whorl support member,

(b) means for selectively mounted said whorl support member to said frame for operative engagement with a tangential drive belt in either a first configuration wherein the belt engages one side of the drive whorl or a second configuration wherein the belt engages the other side of the drive whorl, and so that the rotational direction of the drive whorl may be reversed, said mounting means including disengaging means for moving said whorl in a direction perpendicular to its axis in each of its two operating configurations and such that said whorl may be selectively positioned to contact said drive belt or be withdrawn from said drive belt in each of said two operating configurations,

(c) a drive pulley rotatably mounted in said whorl support member and operatively connected to said drive whorl for concurrent rotation therewith,

(d) a belt pulley operatively connected to each of said twist imparting members,

(e) an idler pulley rotatably mounted to said frame, and

(f) endless belt means operatively interconnecting said drive pulley, said two belt pulleys, and said idler pulley for effecting concurrent rotation thereof with rotation of said drive whorl.

4,559,776

CATALYTIC CONVERTER MOUNTING STRUCTURE FOR ENGINES

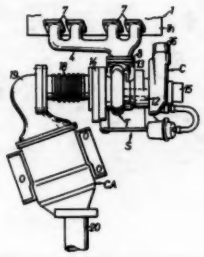
Sakuji Arai; Katsuaki Sato; Susumu Kochi, and Hiroaki Hishida, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,689

Claims priority, application Japan, Sep. 8, 1982, 57-136481[U]

Int. Cl.[4] F02B *37/00*; F01N *7/00*

U.S. Cl. 60—280 3 Claims



1. An exhaust system for multiple cylinder-in-line engine having the exhaust ports on one side, comprising, an exhaust manifold having means connected to each exhaust port and extending substantially the length of the engine with ends located at the extreme ends of the exhaust ports, said exhaust manifold having an outlet located near one end and facing outwardly from the engine, a turbo supercharger having an exhaust gas inlet connected directly to said exhaust manifold outlet and an exhaust gas outlet facing parallel to the engine length and toward the other end of said exhaust manifold, a flexible exhaust tube connected to said turbo supercharger exhaust gas outlet and extending therefrom substantially parallel to the engine for a distance short of the other end of the engine, an elongated catalytic converter having an inlet connected to said flexible exhaust tube, said catalytic converter extending downwardly with an outlet at the bottom for connecting to an exhaust pipe, a substantially rigid bracket having means connecting same to the engine and said catalytic converter for structurally supporting the catalytic converter from the engine, and said flexible exhaust tube including means for accommodating thermal expansion and absorbing vibration between said turbo-supercharger and said catalytic converter.

4,559,777

POWER STEERING APPARATUS WITH AT LEAST ONE ADDITIONAL HYDRAULIC LOAD CONNECTED TO IT

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,624

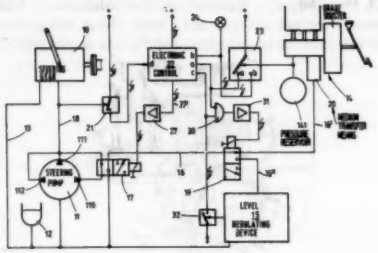
Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319408

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—422 10 Claims

1. A power steering apparatus having at least a first hydraulic load connected to it, which comprises a steering gear and a steering pump connected therewith by a connecting line for supplying hydraulic oil to the steering gear, said steering pump has a plurality of feed chambers separate from one another, and that said first load is connected to one of the feed chambers of said steering pump by a connecting line, a reversing valve disposed in the connecting line between the steering pump and said first hydraulic load, said reversing valve including two

switching positions which in one of said two switching positions of said reversing valve, the connecting line to the additional load is interrupted and one feed chamber of the steering pump is additionally connected with the steering gear, an electromagnetically sequencing valve connected in said connecting line between said reversing valve and said first hydraulic load, a second hydraulic load with a lower supply priority as compared with said first hydraulic load connected via said electromagnetic sequencing valve to said connecting line between the reversing valve and said first hydraulic load in which said sequencing valve in one of two switching positions disconnects said first hydraulic load from said connecting line and connects said second hydraulic load to said reversing



valve, and said sequencing valve is controlled by a first pressure switch connected to said first load in such a manner that the sequencing valve assumes its switching position disconnecting said second load whenever a pressure in said first load is below a predetermined value, a second pressure switch connected with said second load in which said second pressure switch emits a sequencing signal for the sequencing valve whenever the pressure in the second load is below a predetermined value, and that the sequencing signal is logically linked with an output signal of said first pressure switch in such a manner that the sequencing signal reaches the sequencing valve only when the pressure in the first load is above the predetermined pressure value.

4,559,778

CONTROL DEVICE FOR A HYDROSTATIC TRANSMISSION

Alfred Krusche, Johannesberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

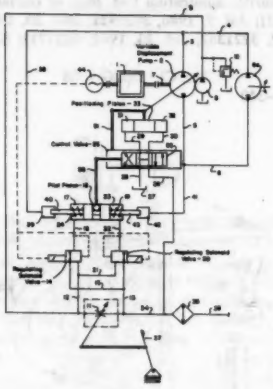
Continuation-in-part of Ser. No. 42,295, May 25, 1979, abandoned. This application Jun. 4, 1982, Ser. No. 384,800

Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823559

Int. Cl.⁴ F16H *39/46*

U.S. Cl. 60—447 **5 Claims**

1. An apparatus in combination with a hydrostatic transmission including a variable displacement pump and a motor, said variable displacement pump having an input shaft driven by an engine, said apparatus comprising servo-positioning means for varying the displacement of said variable displacement pump, signal producing means for producing a first signal dependent upon the rotational speed of said input shaft, means for communicating said first signal dependent on the rotational speed of said input shaft to said servo-positioning means, means for communicating a second signal dependent upon the output pressure of said variable displacement pump to said servo-positioning means, said servo-positioning means including means responsive to the difference between said first signal dependent on the rotational speed of said input shaft and said second signal dependent on said variable displacement pump output pressure, said means for producing said first signal dependent on the rotational speed of said input shaft for said pump including a constant displacement pump connected with said input shaft of said variable displacement pump, said means for communicating said first signal to said servo-positioning means including an output line from said constant displacement pump, a restrictor in said output line, said conduit means for conducting the pressure upstream of said restrictor to said servo-positioning means, said variable displacement pump being adapted to provide a reversible flow of fluid, said servo-positioning means includes a piston having two piston faces and axially slidable in a bore and a pressure chamber at each



end of said bore, and a pair of opposed auxiliary pistons axially slidable in an auxiliary bore under the influence of said second signal dependent on the output pressure of said variable displacement pump, said auxiliary pistons abuttingly engaging said piston to thereby influence the axial position of said piston in said bore, said conduit means for conducting the pressure upstream of said restrictor to said servo-positioning means includes conduits connected with each of said pressure chambers and individually actuable solenoid valves controlling the flow of fluid in said conduits.

4,559,779

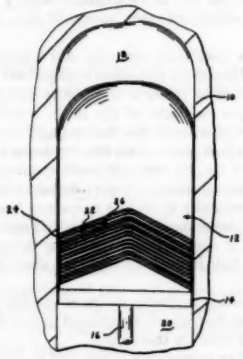
DISPLACER FOR STIRLING ENGINE

Alec T. Brown, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,958

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—517 **10 Claims**



1. In an external combustion engine such as a Stirling engine and the like in which a cycle of operation includes moving a

working gas between expansion and compression spaces, a displacer for moving the working gas, said displacer having a hollow interior area; a plurality of circular, conically shaped spaced baffles axially positioned in a layered fashion in said hollow interior; and said baffles being positioned in the interior area so as to prevent undesired heat transfer across the displacer.

4,559,780

POWER VALVE FOR A VEHICLE BRAKING SYSTEM

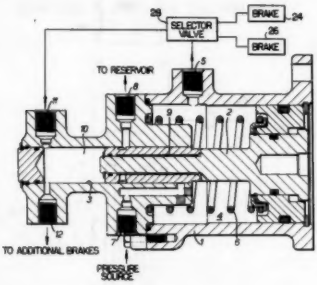
Philip A. Taft, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 22, 1982, Ser. No. 435,942

Claims priority, application United Kingdom, Nov. 5, 1981, 8133452

Int. Cl.⁴ F15B *7/00*; B60T *15/04*

U.S. Cl. 60—548 **9 Claims**



1. In a power valve for controlling the flow of pressurized fluid from a source of pressurized fluid to a vehicle braking system, comprising a body having a stepped bore including inner and outer parts, a spool received in the bore and having an inner end slidable in said inner bore part and a rear end sealed to the body, and a pressure chamber confined in the outer part of the bore between the body and the spool, the body including an inlet for fluid under pressure, an outlet communicating with the pressure chamber and a reservoir port normally communicating with the pressure chamber, and the spool being displaceable under an applied input effort to interrupt said communication between the reservoir port and the pressure chamber and to open up communication between the inlet and pressure chamber for a dependent upon the magnitude of the input effort to be supplied to the outlet, the improvement which comprises:

an auxiliary chamber defined in said inner bore part and sealed against direct communication with said pressure chamber; and

a control port in the body connected to the auxiliary chamber, and means for selectively supplying fluid pressure through said control port to said auxiliary chamber to exert a force on the spool opposing inward movement of the spool and thereby to selectively modify the pressure supplied to said outlet for a given input effort applied to the spool.

4,559,781

MASTER CYLINDER

John E. Steer, South Bend, and Donald A. Crumb, Granger, both of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 31, 1983, Ser. No. 546,774

Int. Cl.⁴ B60T *11/20*

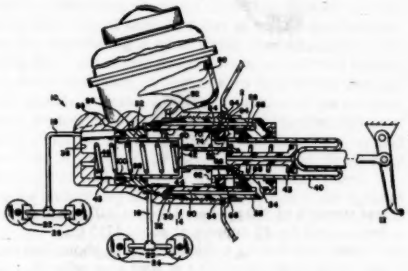
U.S. Cl. 60—562 **6 Claims**

1. A master cylinder having a pair of pistons movably disposed within a housing bore to generate fluid pressure within a pair of pressure chambers during braking, one of the pair of pistons substantially closing an open end of the housing bore and cooperating with the other piston to substantially define one of the pair of pressure chambers, the other piston cooperating with a closed end of the housing bore to define the other pressure chamber, the one piston cooperating with a first seal assembly at a large diameter section of said housing bore to generate a first fluid pressure during a first operational mode of braking and cooperating with a second seal assembly at a small diameter section of said housing to generate a second fluid pressure during a second operational mode of braking, said first seal assembly comprising:

an inner O-ring radially connected to said one piston;

an outer O-ring seal radially connected to said inner O-ring seal by a resilient web; and

a stop member carried by said one piston, said outer O-ring



on movement of said one piston in response to an input force engaging said large diameter section of said housing during said first operational mode and with said one piston creating said first fluid pressure, said first fluid pressure acting on and overcoming said resilient web to move said outer O-ring seal out of engagement with said large diameter section and into engagement with said stop and thereafter allow further movement of said one piston with respect to said second seal assembly to create said second fluid pressure, said resilient web on termination of said input force and during the return of said one piston toward a rest position moving said outer O-ring seal out of engagement with said stop and back to a substantially radial position.

4,559,782

TURBOCHARGER DRAIN LINE WITH REINFORCED FLEXIBLE CONDUIT

Stephen Ritchey, North Vernon, and Jerry L. Kruse, Columbus, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Mar. 25, 1983, Ser. No. 478,870

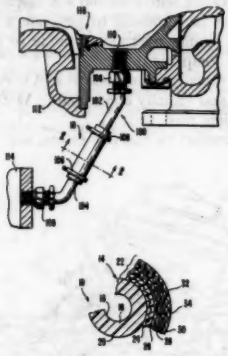
Int. Cl.⁴ F02B *33/44*

U.S. Cl. 60—605 **4 Claims**

1. In a turbocharger drain line interconnecting a turbocharger housing and the block of an internal combustion engine on which the turbocharger is used, the drain line adapted for returning lubricating oil from the turbocharger to the engine lubricating system, a flexible tubular conduit forming a portion of said drain line, said conduit comprising an integral tubular wall having inner and outer adhered, coaxial layers, said inner layer defining the conduit inner wall surface in contact with the fluid flowing therethrough and formed of a used lubricating oil resistant silicone rubber and said outer layer comprising at least one lamina formed of woven aromatic polyamide reinforcing fabric coated with a high modulus, high tear strength silicone rubber,

said used lubricating oil resistant silicone rubber comprising a filled, heat vulcanizable silicone rubber composition including organopolysiloxane polymers and blends thereof having a viscosity of 1,000,000 to 200,000,000

centipoise at 25° C. and a curing catalyst, said rubber having a specific gravity in the cured state of 1.20 to 1.70, said high modulus, high tear strength silicone rubber having a Shore A-2 Durometer Hardness of 55, a tensile strength of 1350 psi, an elongation modulus of 250%, and a Die B



tear strength of 300 ppi based upon a 0.075-inch-thick slab press cured for 10 minutes at about 171° C.,

said inner layer having a thickness up to about 0.04 inches, said outer layer comprising at least four adhered, coaxial lamina and each lamina having a thickness of 0.01 to 0.02 inches.

4,559,783

TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH ADJUSTABLE LENGTH PIPE SECTIONS

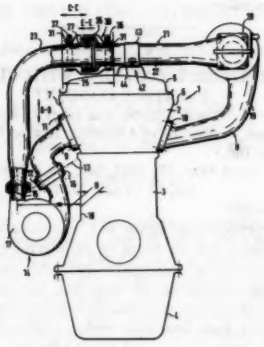
Herbert Ampferer, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,202

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217633

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—605 **13 Claims**



1. A turbocharged internal combustion engine having a connecting line between the compressor of the exhaust gas turbocharger and a suction pipe means of the internal combustion engine, characterized in that the connecting line includes at least two nested pipe sections, one disposed within the other, wherein said two pipe sections can be secured together in any one of a number of differently extending telescoped positions by way of sealing means, said pipe sections being rigidly connected with each other in any one of said telescoped position by a connection means having disengageable means to secure said connection means to said pipe sections.

4,559,784

METHOD AND APPARATUS FOR REGULATING A BYPASS FLOW OF A SUPERCHARGED INTERNAL COMBUSTION ENGINE

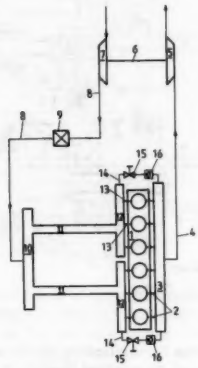
Ernst Jenny, Baden, and Bruno Zumstein, Lucerne, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 12, 1980, Ser. No. 129,425

Claims priority, application Switzerland, Mar. 14, 1979, 2399/79

Int. Cl.⁴ F02B *37/12*

U.S. Cl. 60—606 **6 Claims**



1. Apparatus for diverting and regulating a bypass flow of a turbosupercharged internal combustion piston engine, comprising:

an internal combustion engine having an exhaust manifold,

a turbosupercharger for supplying compressed air to said internal combustion engine to produce a supercharging of said engine,

bypass means for diverting a portion of compressed air to said exhaust manifold,

said bypass means including at least one bypass duct with valve means for regulating a flow of said compressed air through said bypass duct, and a non-return valve, and

at least one oscillation pipe and at least one air inlet manifold downstream therefrom, said at least one oscillation pipe containing a column of air for generating periodic pressure pulsations in the at least one inlet manifold and periodic pressure differences across said bypass means for diverting a part of said compressed air via said non-return valve to said exhaust manifold, said column of air in the at least one oscillation pipe being responsive to pressure pulsations emanating from the strokes of the pistons of said engine within a predetermined range of engine speeds, and the length of the at least one oscillation pipe being dimensioned so that the natural frequency of its column of air at least approximately equals the frequency of said pressure pulsations corresponding to said predetermined range of engine speeds.

5. A method for diverting and regulating a bypass flow of a supercharged internal combustion piston engine, comprising the steps of:

supplying compressed air from a source of said air to an internal combustion engine to produce a supercharging of said engine,

diverting a portion of said compressed air from said source

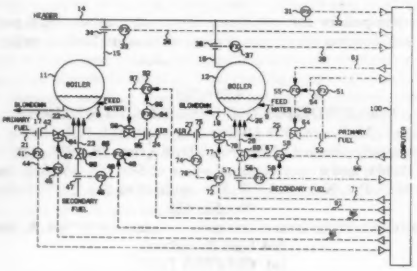
to the exhaust side of said engine through a bypass duct, and

generating periodic pressure differences across said bypass duct to promote a flow of said compressed air through said bypass duct, said periodic pressure differences being generated by an oscillating air column brought into resonance in response to pressure pulsations emanating from the strokes of the pistons of said engine in a predetermined range of engine speeds, said air column being arranged within a conduit, and said conduit being in fluid communication with the inlet side of said engine and said bypass duct.

4,559,785
BOILER CONTROL

Larry D. Gaines, and Merle R. Likins, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 9, 1985, Ser. No. 690,087
Int. Cl.[4] F01K *13/00*
U.S. Cl. 60—676 **4 Claims**



1. Apparatus comprising:

a first boiler having a first burner associated therewith;

means for supplying a first fuel stream to said first burner;

means for supplying a second fuel stream to said first burner;

means for supplying a first air stream to said first burner, wherein the combustion of said first fuel stream and said second fuel stream with said first air stream at said first burner supplies heat to said first boiler and wherein said first fuel stream has a different BTU content than said second fuel stream;

a header conduit;

means for supplying steam from said first boiler to said header conduit;

a second boiler having a second burner associated therewith;

means for supplying a third fuel stream to said second burner;

means for supplying a fourth fuel stream to said second burner;

means for supplying a second air stream to said second burner, wherein the combustion of said third fuel stream and said fourth fuel stream with said second air stream at said second burner supplies heat to said second boiler and wherein said third fuel stream has a different BTU content than said fourth fuel stream;

means for supplying steam from said second boiler to said header conduit;

means for establishing a first signal representative of the pressure in said header conduit;

means for establishing a second signal representative of the desired pressure in said header conduit;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the total heat per unit time which must be supplied to said first boiler and said second boiler by the combustion of said first, second, third and fourth fuel streams in order to maintain the actual pressure in said header conduit substantially equal to the desired pressure represented by said second signal;

means for establishing a fourth signal representative of the actual flow rate of steam from said first boiler to said header conduit;

means for establishing a fifth signal representative of the actual flow rate of steam from said second boiler to said header conduit;

means for establishing a sixth signal representative of the actual flow rate of said first fuel to said first burner;

means for establishing a seventh signal representative of the actual flow rate of said second fuel to said first burner;

means for establishing an eighth signal representative of the actual flow rate of said third fuel to said second burner;

means for establishing a ninth signal representative of the actual flow rate of said fourth fuel to said second burner;

means for establishing, in response to said fourth through ninth signals, a tenth signal representative of the percentage of the total heat per unit time represented by said third signal which should be supplied to said first boiler by said first fuel in order to substantially optimize the energy efficiency of said first boiler and said second boiler;

means for multiplying said third signal by said tenth signal to establish an eleventh signal representative of the heat per unit time which must be supplied to said first boiler by the combustion of said first fuel stream;

means for manipulating the flow of said first fuel stream in response to said eleventh signal;

means for establishing, in response to said fourth through ninth signals, a twelfth signal representative of the percentage of the total heat per unit time represented by said third signal which must be supplied to said first boiler by said second fuel stream in order to substantially maximize the energy efficiency of said first and second boilers;

means for multiplying said third signal by said twelfth signal to establish a thirteenth signal which is representative of the total heat per unit time which must be supplied to said first boiler by the combustion of said second fuel stream;

means for manipulating the flow of said second fuel stream to said first burner in response to said thirteenth signal;

means for manipulating the flow of said first air stream to said first burner in response to the combination of said eleventh signal and said thirteenth signal;

means for establishing, in response to said fourth through ninth signals, a fourteenth signal representative of the percentage of the total heat per unit time represented by said third signal which should be supplied to said second boiler by said third fuel stream in order to substantially optimize the energy efficiency of said first boiler and said second boiler;

means for multiplying said third signal by said fourteenth signal to establish a fifteenth signal representative of the heat per unit time which must be supplied to said second boiler by the combustion of said third fuel stream;

means for manipulating the flow of said third fuel stream to said second burner in response to said fifteenth signal;

means for establishing, in response to said fourth through ninth signals, a sixteenth signal representative of the percentage of the total heat per unit time represented by said third signal which must be supplied to said second boiler by said fourth fuel stream in order to substantially maximize the energy efficiency of said first and second boilers;

means for multiplying said third signal by said sixteenth signal to establish a seventeenth signal which is representative of the total heat per unit time which must be supplied to said second boiler by the combustion of said fourth fuel stream;

means for manipulating the flow of said fourth fuel stream to said second burner in response to said seventeenth signal; and

means for manipulating the flow of said second air stream to

said second burner in response to the combination of said fifteenth signal and said seventeenth signal.

4,559,786

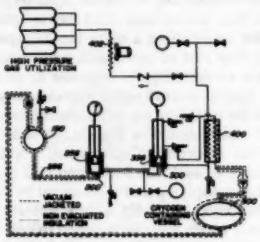
HIGH PRESSURE HELIUM PUMP FOR LIQUID OR SUPERCRITICAL GAS

Thomas W. Schuck, Easton, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 350,914, Feb. 22, 1982, Pat. No. 4,447,195. This application Feb. 8, 1984, Ser. No. 578,235

Int. Cl.⁴ F17C *7/02*

U.S. Cl. 62—55 **3 Claims**



1. A method for compressing a low temperature high density liquid gas, liquid and saturated gas, liquid helium, or helium gas at supercritical temperature and pressure but high density comprising the steps of:

withdrawing and transferring said fluid from a storage receptacle to an accumulator of a first inlet of a two stage compressor;

compressing the fluid in the first stage to a pressure intermediate that of the storage receptacle and the final pressure at which the liquid gas, liquid and saturated gas, liquid helium or helium gas is to be compressed;

transferring the pressurized fluid from the first stage to a second stage permitting warming of the fluid during transfer and compressing said fluid to the pressure required at the point of delivery; and

heat exchanging and warming the fluid exiting the second state against ambient atmosphere and discharging said warmed fluid to a point of use.

4,559,787

VACUUM PUMP APPARATUS

Thomas H. Batzer, Livermore, and Wayne R. Call, Tracy, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1984, Ser. No. 678,148

Int. Cl.⁴ F17C *7/02*

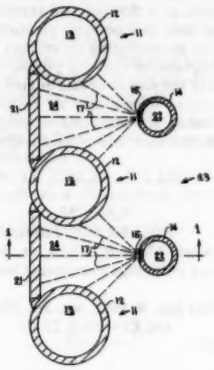
U.S. Cl. 62—55.5 **20 Claims**

1. In a cryogenic pumping means including at least one cryopumping cell having cryogenic surfaces, the improvement comprising:

at least one hollow member which is open at each end and constructed of a thermally conductive material, each end of which is adapted to be in controlled communication with an associated reservoir;

an interior surface of said hollow member being adapted to form a conduit between an associated reservoir through which an associated cryogenic coolant is adapted to be passed and;

an exterior surface of said hollow member adapted to being exposed to an associated space to be cryogenically



pumped for the entrapment by condensation of gas particles which come into contact with said exterior surface.

4,559,788

AIR CONDITIONING SYSTEM AND METHOD

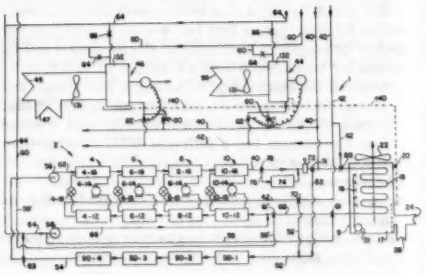
Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090

Continuation-in-part of Ser. No. 301,655, Sep. 18, 1981, Pat. No. 4,419,864, and a continuation-in-part of Ser. No. 340,328, Jan. 18, 1982, Pat. No. 4,413,478. This application Sep. 26, 1983, Ser. No. 535,658

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.⁴ F25D *17/02*

U.S. Cl. 62—98 **17 Claims**



1. An air conditioning system which includes, refrigeration means which is operative to produce a stream of cooled water and a stream of heated water, a plurality of air-treating units each of which is operative to pass air in heat exchange relationship with water from one of said streams to thereby heat or cool air and to then deliver the air to an air conditioned space, a continuous water pumping and circulating system which circulates streams of water throughout the air-conditioning system, a water-to-fluid heat exchange which is adapted to pass water from one or the other of said streams of heated water or cooled water in heat-exchange relationship with a fluid which acts as a heat sink or as a heat source depending upon the relative temperatures of the water and the fluid, and control means which maintains a heat balance in the air conditioning system includes means for passing water from said stream of heated water through said water-to-fluid heat exchanger when the ambient outside temperature is above the break even tem-

perature whereby said fluid acts as a heat sink, and passing water from said stream of cooled water through said water-to-fluid heat exchanger when the outside ambient temperature is below said break even temperature whereby said fluid acts as a heat source.

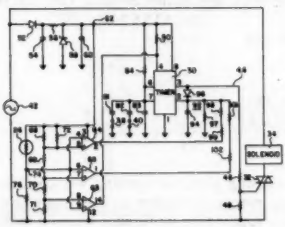
17. In a method of maintaining a heat balance condition in an air conditioning system which provides desirable conditions within a space or spaces, and which includes refrigeration means to produce a stream of heated water and a stream of cooled water and air-treating means to pass air to said space or spaces in heat-exchange relationship with said heated water or said cooled water, and wherein said system also includes a water-to-fluid heat exchanger which passes the desired amount of water from said stream of heated water into heat-exchange relationship with a fluid which constitutes a heat sink to which heat is delivered when the outside ambient temperature is above the break-even temperature, the improvement which includes the steps of, stopping the delivery of said heated water to said water-to-fluid heat-exchanger when the outside ambient temperature is below said break-even temperature, and delivering a controlled stream of cooled water from said stream of cooled water to said water-to-fluid heat-exchanger with said cooled water being maintained at a temperature below the temperature of said fluid to thereby deliver heat to said controlled stream of cooled water, and returning said controlled stream of cooled water to said refrigeration means, whereby said water-to-fluid heat exchanger acts as a source of heat for said system, and which includes the steps of, increasing the quantity of outside air to provide cooling when the system has a dominate cooling load and the outside air temperature is below the desired temperature within the air conditioned space and there is an anticipated dominate heating load condition, and passing water to said storage tanks at a temperature above the temperature of the water leaving said tanks to thereby increase the capacity of the water in said storage tanks to handle a subsequent heating load.

4,559,789

VARIABLE CYCLE MOISTURIZING CONTROL CIRCUIT FOR A GAS-LIQUID CONTACT PAD

Jan C. Riek, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Mar. 15, 1984, Ser. No. 589,730
Int. Cl.[4] G05D *23/19*; F28D *3/00*
U.S. Cl. 62—157 **8 Claims**



4. A variable cycle moisturizing control circuit for a gas-liquid contact pad supplied with fluid from controllable valve means, comprising:

switch means for controlling said valve means and actuatable between ON and OFF states;

timing means for actuating said switch means and having cyclic ON and OFF timed intervals respectively controlling said ON and OFF states of said switch means;

temperature sensitive means responsive to ambient temperature for changing the relative timing of said ON and OFF timed intervals such that the duration of one increases relative to the other in response to changing temperature;

wherein said timing means has a first disabled mode below a given temperature and maintains said switch means in said OFF state, and has a second enabled mode above said given temperature providing said ON and OFF timed intervals;

wherein said relative timing of said ON and OFF intervals is changed by an RC network in circuit with said timing means, and comprising a temperature sensor connected in circuit with said RC network to change the resistance value in the latter in response to changing temperature;

and comprising:

a plurality of comparators;

means for supplying different respective reference voltages to said comparators, and supplying voltage to said temperature sensor;

and wherein:

said RC network has a plurality of branches for different temperature thresholds above said given temperature, one branch for each of said comparators;

said temperature sensor has a resistance which changes as a function of sensed ambient temperature, to thus provide a temperature dependent variable voltage thereacross;

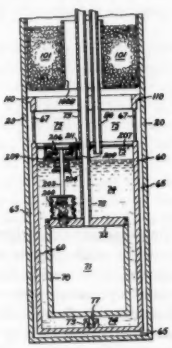
said comparators compare said different respective reference voltages against said temperature dependent voltage from said temperature sensor for generating respective output signals to respective said branches for changing the timing constant of said RC network.

4,559,790

APPARATUS FOR MAINTAINING ELECTRONIC EQUIPMENT AND THE LIKE AT LOW TEMPERATURES IN HOT AMBIENT ENVIRONMENTS

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,786
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—259.3 **14 Claims**



1. A self-contained apparatus for maintaining electronic equipment and the like at low temperatures in hot ambient environments, said apparatus comprising:

an outer housing;

an inner dewar disposed within said outer housing so as to be thermally insulated therefrom;

an inner housing for containing said equipment, said inner housing being disposed within said inner dewar;

a quantity of coolant absorbent material disposed within said inner dewar;

a cooling medium disposed within said housing either wholly or partially in its liquid phase which is contained within said inner dewar and about said inner housing, or wholly or partially absorbed by said coolant absorbent material, said absorbent material being capable of absorption of the vapor phase of said coolant medium, said vapor

phase being in fluid communication with said absorbent material and with said liquid phase; and

a pressure activated, thermostatically control valve for interrupting fluid communication between said vapor phase and said absorbent material in response to thermal conditions in said inner housing,

whereby thermal conditions about said inner housing can be controlled through the control vaporization of the liquid phase of said coolant medium together with its absorption by said absorption material within said outer housing.

4,559,791

FLAT KNITTING MACHINE WITH SELECTIVE NEEDLE SELECTION

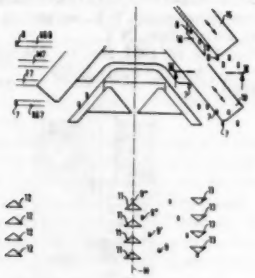
Reinhold Schimko, and Werner Paul, both of Aalen-Wasseralfingen, Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Wasseralfingen, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,250

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 3340197

Int. Cl.⁴ D04B *7/00*

U.S. Cl. 66—75.1 **6 Claims**



1. A flat knitting machine comprising:

(a) knitting needles with flexible shanks arranged in the needle channels of the needle beds, each needle having first and second operating butts;

(b) Jacquard jacks with flexible shanks adapted to be retained either in an upper or in a lower position with respect to the needle bed, the needle shanks being engageable from below by the Jacquard jack shanks in the region of the first operating butts;

(c) selectively actuatable selection flaps for selective extension of the Jacquard jacks into positions in which the knitting needles can form stitches or tuck loops;

(d) first withdrawal cam elements on a knitting cam unit arranged for engagement with said first operating butts;

(e) second withdrawal cam elements on said knitting cam unit arranged for engagement with said second operating butts;

(f) pressure cam elements on said knitting cam unit in the region of said second withdrawal cam elements and effective to depress said first operating butts into the needle bed;

(g) and further selectively actuatable selection flaps for selective withdrawal of the Jacquard jacks into a position in which said first operating butts of the needles are not engageable by said first withdrawal cam elements.

4,559,792

THREAD CARRIER

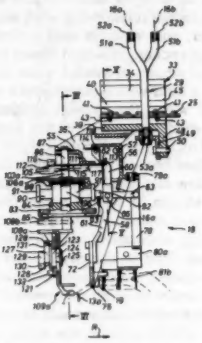
Eberhard Leins, Filderstadt, Fed. Rep. of Germany, assignor to Sulzer Morat GmbH, Filderstadt, Fed. Rep. of Germany

Filed Sep. 13, 1984, Ser. No. 650,262

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333500

Int. Cl.⁴ D04B *3/06*

U.S. Cl. 66—125 R **11 Claims**



1. Thread carrier for a knitting machine, having an inserter **(19)** which is in the form of an open channel **(76)** at its extremity where the thread **(16)** emerges, and having at least one controllable thread gripper, characterized in that the inserter **(19)** and the thread gripper **(109)** are disposed movably relative to one another such that the thread can either be inserted into the channel **(76)** or removed therefrom by the thread gripper **(109)** itself.

4,559,793

PROCESSING PLANT FOR TREATING HIDES, SKINS, PIECES OF LEATHER AND THE LIKE

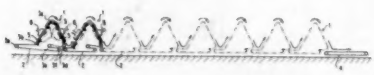
Karl-Otto Geweniger, Akerövägen 11, S-262 00 Ängelholm, Sweden

Filed Oct. 8, 1982, Ser. No. 433,487

Claims priority, application Sweden, Oct. 12, 1981, 8106008

Int. Cl.⁴ C14B *1/02*

U.S. Cl. 69—33 **1 Claim**



1. A processing plant for treating workpieces consisting of hides, skins, pieces of leather or like materials, comprising: frame means supporting workpiece treating means and workpiece conveyor means including endless belt means, and guide means for said belt means, wherein said plant comprising an assemblage of a plurality of independent machine units arranged in a cooperative manner, each of which units comprises a frame, an endless belt conveyor having a workpiece receiving end and a workpiece delivering end, guide means for said belt conveyor and at least one workpiece treating means for effecting at least one of a plurality of treating operations, said units including the respective frames, belt conveyors and guide means being of fundamentally the same basic construction, the workpiece receiving end of the belt conveyor of each of said machine units, except the first one in the assemblage thereof, being arranged and positioned to receive workpieces transported to the delivering end of the belt conveyor of each preceding one of said units for moving said workpieces in a continuous path along the assemblage of machine units to be treated successively by their treating means, each of said units

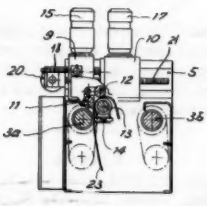
being capable of being driven in interaction with the other units at a different speed, said treating means supported by said frames of the machine units being selected and adapted to effect a series of treating operations including operations by which the length of each workpiece is changed, each of said units comprising driving means which are controlled to drive the respective conveyor belt at a speed such that said belt conveyors are adapted to transport said workpieces continuously along said path so that the individual speed of the conveyor of each succeeding unit compensates for any change in the length of workpieces in the preceding unit, the units being arranged and dimensioned so that each conveyor belt comprises an upwardly inclined workpiece transporting run and a downwardly inclined workpiece transporting run, and said belt conveyors of said machine units together form a continuous sinusoidal transporting path of a substantially greater length than the total horizontal length of said assemblage of machine units.

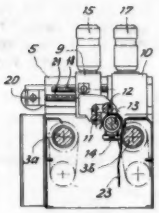
4,559,794

AUTOMATIC CYCLE MACHINE FOR THE CONTINUOUS FLESHING OF SKINS

Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy

Filed Aug. 18, 1983, Ser. No. 524,294
Claims priority, application Italy, Sep. 10, 1982, 23215 A/82
Int. Cl.[4] C14B *1/06*
U.S. Cl. 69—43 **7 Claims**





1. A continuous fleshing machine for processing a skin from a middle area toward each of two opposite ends of the skin, said machine comprising:

a frame;

a pair of blade cylinders journaled on said frame and transversely spaced apart but parallel to one another and rotatable in opposite senses;

guide means on said frame extending transverse to said blade cylinders for defining a path of movement transverse to said cylinders;

a first head shiftable on said guide means along said path and provided with a bearing roller for receiving a skin and means for pressing said skin against said blade cylinders, said bearing roller being disposed between said blade cylinders;

a second head provided with a pair of drawing rollers and shiftable on said guide means along said path, said drawing rollers being positioned to cooperate with said bearing roller and hold said skin thereon in a position of said heads wherein said heads are proximal to one another;

respective drives on said heads for driving said bearing roller and said drawing rollers;

first movement means for relatively displacing said heads for bringing together said drawing rollers and said bearing roller and for shifting said drawing rollers and said bearing roller apart; and

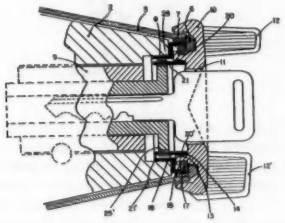
second movement means for displacing said heads jointly along said guide means.

4,559,795

PASSIVE ANTI-THEFT DEVICE FOR VEHICLE IGNITION LOCK

Dimiter S. Zagoroff, 10 Hilliard Pl., Cambridge, Mass. 02138

Filed Jun. 9, 1983, Ser. No. 502,668
Int. Cl.[4] E05B *15/16, 63/00*
U.S. Cl. 70—422 **7 Claims**



1. In a protective device for an ignition lock system of a motorized vehicle of the type in which an ignition lock housing extends about a steering column, and an ignition lock cylinder is at one side of the housing, said protective device comprising

an armored cap arranged axially with and covering the end of said cylinder, and means providing a bearing surface for said cap, said cylinder and cap adapted for mutual rotation about the axis of the cylinder to activate the vehicle ignition when a mating key is fully inserted through said cap into said cylinder, said cap adapted to be rotated by hand to rotate said cylinder, and

a protective cowl comprising at least two opposed shield elements constructed and arranged to be fixedly disposed about the ignition lock housing and, when assembled, sized to closely surround the housing, said cowl sized and constructed to protect the ignition lock cylinder to prevent unauthorized access thereto by car thieves,

The Improvement Wherein

said protective cowl further comprises a conical protrusion extending about said housing and terminating in said rotatable cap bearing surface adjacent the end of said cylinder, and

said protective device comprises a torque-sensitive coupling means adapted to be disposed in coupling relationship between said lock cylinder and said cap,

said coupling means constructed and arranged to transmit torque applied to said cap to said lock cylinder where said torque is of a value below a predetermined maximum value selected to exceed normal torque applied to an unlocked cylinder by a hand action of a vehicle operator, said maximum torque value being less than that needed to force rotation of said cylinder when said cylinder is still locked,

said coupling means being adapted to disengage between said cap and said cylinder when torque above said predetermined maximum value is applied to said cap,

whereby said cap and said cylinder are positively related to prevent independent rotation of either during normal operation, e.g. to avoid damage to a key that has been only partially inserted into said cylinder, said cap being free to

turn in uncoupled relationship with said cylinder when abnormal torque is applied to the cap, thereby to prevent rotation of the cylinder by force of a car thief.

4,559,796

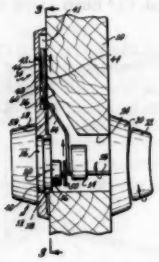
DOOR LOCK STATUS INDICATOR

William De Forrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed Feb. 10, 1984, Ser. No. 578,973

Int. Cl.[4] E05B *41/00*

U.S. Cl. 70—432 **12 Claims**



1. A status indicator for a door lock of the type having a rotating member and a tail piece attaching to said rotating member so as to be rotated by said rotating member the status indicator which comprises:

linking means operatively connected to said tail piece so as at least a first portion of said linking means is rotated by said tail piece in response to rotation of said rotating member and in response to rotation of at least said first portion of said linking means a second portion being capable of movement between a first position and a second position;

indicating means located on said door so as to be visible on said door, said indicating means operatively associated with said second portion of said linking means so as to be operated on by said second portion of said linking means, said indicating means for indicating a locked state of said door and an unlocked state of said door, said indicating means indicating said locked state in response to movement of said second portion of said linking means to one of said first or said second positions and said indicating means indicating said unlocked state of said door in response to movement of said second portion of said linking means to the other of said first or said second positions;

said linking means includes a rotational to translational moving means operatively interspaced between said tail piece and said indicator means so as to be rotated by said tail piece and in response to said rotating producing a translational movement, said indicator means in response to said translational movement moving between said first and said second positions;

said linking means includes a tail piece member operatively connected to said tail piece so as to be rotated by said tail piece in response to rotation of said rotating member;

said linking means further including a linking member having ends, the first of said ends of said linking member operatively connected to said tail piece member so as to be moved in an arcuate pathway in response to rotation of said tail piece member, the second of said ends of said linking member moving linearly in response to arcuate movement of said first end.

4,559,797

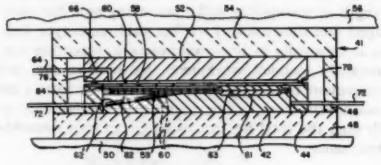
METHOD FOR FORMING STRUCTURAL PARTS

Roger S. Raymond, Redondo Beach, Calif., assignor to Delaware, El Segundo, Calif.

Division of Ser. No. 519,640, Aug. 2, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,867

Int. Cl.[4] B21D *22/12*

U.S. Cl. 72—63 **11 Claims**



1. A method for producing a metallic structure of predetermined shape from a metal workpiece which comprises:

providing an apparatus containing a forming die having a contoured surface of predetermined shape;

positioning a formable metal workpiece adjacent to said forming die;

providing a pressure diaphragm of a metal sheet capable of superplastic forming adjacent to said workpiece;

bringing said diaphragm to within an elevated temperature range suitable for superplastic forming of said diaphragm; and

applying pressure to one side of said diaphragm to plastically deform said diaphragm by superplastic forming against said workpiece and in turn deforming said workpiece against said forming die to produce a structural component of predetermined shape.

4,559,798

FILLET ROLLING MACHINE

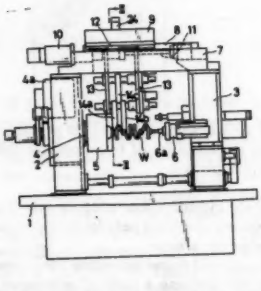
Takehiko Hayashi, Toyota; Hiroyuki Ikuta, Nagoya, and Toshiki Shindo, Ohbu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 26, 1984, Ser. No. 654,365

Claims priority, application Japan, Jul. 9, 1984, 59-140585; Jul. 9, 1984, 59-140586; Jul. 9, 1984, 59-140587

Int. Cl.[4] B21K *1/08*

U.S. Cl. 72—81 **10 Claims**



1. A fillet rolling machine for successively effecting rolling treatments on fillets formed on a crankshaft, comprising in combination:

a frame;

support means mounted on said frame for rotatably carrying a crankshaft to be processed;

drive means connected to said support means for rotating said crankshaft about the axis of the same;

a head support mounted on said frame for movement in a

direction parallel to the axis of said crankshaft being rotatably supported by said support means;

rolling head means mounted on said head support for effecting a rolling treatment upon fillets formed on said crankshaft; and

indexing feed means connected to said head support and controllable in accordance with numerical control data for moving said head support so as to bring said rolling head means into alignment selectively with said fillets of said crankshaft.

4,559,799

ROLLING MILLS

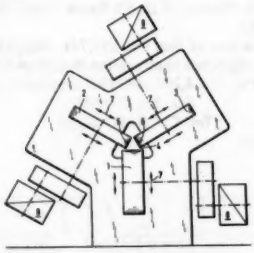
Günther Funke, and Hans-Joachim Eick, both of Siegen, Fed. Rep. of Germany, assignors to Kocks Technuk GmbH & Co., Hilden, Fed. Rep. of Germany

Continuation of Ser. No. 35,077, May 1, 1979, abandoned. This application Sep. 22, 1981, Ser. No. 304,668

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819567

Int. Cl.⁴ B21B *13/08*

U.S. Cl. 72—224 **6 Claims**



1. In a rolling mill arrangement with at least one roll stand for rolling billets into bar material of polygonal form having three adjustable drive roll disks arranged radially to the longitudinal axis of the rolled material so that their working surfaces lie on three intersecting lines defining a triangle, the improvement comprising a maximum working surface on one of the three disks which is at least 20% wider than the maximum working surface of each of the other two roll disks and characterized in that of the working surfaces of the rolls disks at least the working surface of the wider roll disk has a profile in which the major central portion is a straight line and the end portions are turned upwardly towards the other two rolls.

4,559,800

PREHEAT START-UP ARRANGEMENT FOR STAMPING AND FORMING PRESSES

Omar L. Brown, Dayton, Ohio, assignor to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jun. 18, 1984, Ser. No. 621,646

Int. Cl.⁴ B21D *37/16*

U.S. Cl. 72—342 **8 Claims**

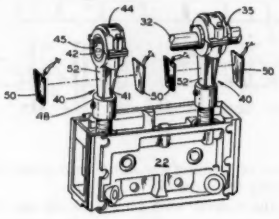
1. In a metalworking press having a rotatable crank, a slide for supporting cooperating tooling to open and close for working sheet metal therebetween, and at least one connection element driven by said crank and attached to said slide to open and close said tooling, in which each said connection element has a central web section which forms at least one exposed outer generally flat surface of a given configuration, the improvement comprising:

at least one a silicone rubber heater pad having an electrical resistance element embedded therein and having a shape generally conforming to said configuration of said exposed connection surface,

means bonding said pad to said connection element on said exposed surface thereof, and

means for applying electric power to said pad for preheating said connection element whereby thermal expansion and lengthening of said element to operating conditions may be accomplished prior to press operation.

7. In a metalworking press having a bed, a crown supported above said bed, a crank in said crown, a slide mounted between said crown and said frame for vertical movement with respect to said bed, and at least one connection between said crank and



said slide for imparting reciprocal movement of said slide with rotary movement of said crank, said connection having an exposed outer surface, the improvement for providing dimensional stability to said connection comprising:

a direct resistance electrical heating pad,

means mounting said pad directly to said connection at said exposed outer surface thereof, and

power supply means for supplying electric energy to said heating pad for preheating said connection to a predetermined operating temperature prior to press start up.

4,559,801

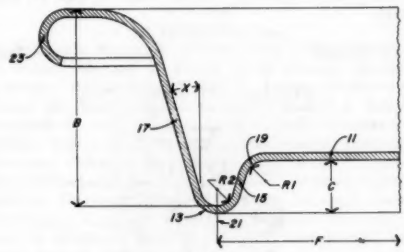
INCREASED STRENGTH FOR METAL BEVERAGE CLOSURE THROUGH REFORMING

Eugene F. Smith, Morrison, and Tuan A. Nguyen, Northglenn, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 26, 1983, Ser. No. 545,556

Int. Cl.⁴ B21D *22/00*

U.S. Cl. 72—348 **12 Claims**



1. A method of producing a sheet metal closure of increased strength, said sheet metal closure having a predetermined countersink depth and a predetermined panel height, comprising:

initially forming a shell having an increased countersink depth relative to said predetermined countersink depth, a reduced panel height relative to said predetermined panel height, and a predetermined countersink radius; and

reforming said shell to decrease said countersink depth to said predetermined countersink depth and increase said panel height to said predetermined panel height while maintaining said predetermined countersink radius.

4,559,802

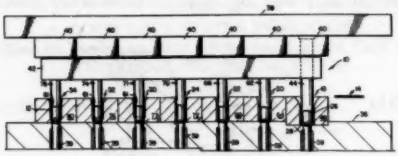
METHOD FOR DRAWING HEAVY WALL SHELLS

John D. Budrean, DeMotte, Ind., and John A. Kirkpatrick, Chicago Heights, Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.

Division of Ser. No. 408,015, Aug. 13, 1982, Pat. No. 4,509,356. This application Feb. 5, 1985, Ser. No. 698,370

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—349 6 Claims



1. A method of forming a material into a part having side walls comprising the steps of:

contacting the material with a draw punch, said draw punch having a diameter variation along its length to define a draw shoulder;

drawing the material through a draw die with said draw punch to form the material; and

forming a step on the side walls of the part between the draw shoulder on said draw punch and said draw die at an angle to the axis of the part; and

contacting the part with a finishing punch, said finishing punch having a diameter variation along its length to define a finishing shoulder; and forming the part through a finishing die with said finishing punch, force being applied to the part by contact between said finishing shoulder and said step.

4,559,803

TOOL FOR MAKING HOLLOW ARTICLES

Edward A. Langford; Reginald L. Neale, both of Birmingham, and Stephen R. James, Redditch, all of England, assignors to PFD Limited, Birmingham, England

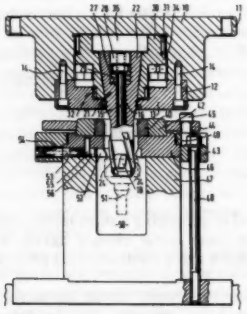
PCT No. PCT/GB83/00246, § 371 Date May 10, 1984, § 102(e) Date May 10, 1984, PCT Pub. No. WO84/01530, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 3, 1983, Ser. No. 610,986

Claims priority, application United Kingdom, Oct. 14, 1982, 8229392

Int. Cl.[4] B21D *45/00*

U.S. Cl. 72—354 4 Claims



1. A tool for use in making a hollow article of the type specified by forming the material of the article about the tool and subsequently withdrawing the tool, the tool comprising first and second parts (**15**, **21**) which are mounted so as to be capable of relative movement parallel to and about a tool axis (which when the tool is in use will be coincident with the longitudinal axis of the bore in the article) so as to bring portions (**22**, **23**, **23***a*, **17**) of the parts into and out of mutual intercalation, each of said portions carrying at least one projection (**18**,**24**) to form a groove, the or each groove which is formed by a projection (**18**) on the first part (**17**) having a longitudinal axis of symmetry which differs (as hereinbefore defined) from the longitudinal axis of symmetry of the or each groove formed by a projection (**24**) on the second portion (**22**, **23**, **23***a*) and wherein, if a portion has more than one projection thereon, the projections on the portion are arranged to form grooves whose longitudinal axes of symmetry are the same (as hereinbefore defined), the arrangement of the intercalating portions (**22**, **23**, **23***a*, **27**) being such that the first part **17** can be withdrawn from the formed article separately from the second part (**22**, **23**) with the projections (**18**) on the first part (**17**) moving along the grooves which have been formed about such projections (**18**).

4,559,804

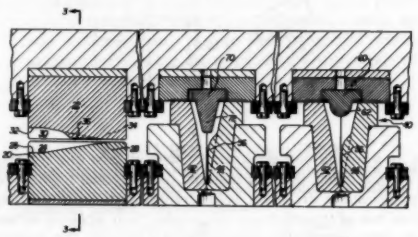
METHOD AND APPARATUS FOR FORGING WEDGE-SHAPED PARTS

Ralph D. Delio, 4355 Brendan La., North Olmsted, Ohio 44070, and Donald J. Diemer, R.D. #1 Susan Trace, New Wilmington, Pa. 16142

Continuation-in-part of Ser. No. 297,741, Aug. 31, 1981, Pat. No. 4,425,779, which is a continuation-in-part of Ser. No. 2,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Jun. 3, 1983, Ser. No. 500,886

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—356 12 Claims



1. A closed die forging apparatus for forming elongated parts, the apparatus comprising:

(a) a lower die holder which defines:

(i) a busting well having a central axis extending in a first direction; and,

(ii) a finishing well having a central axis extending substantially parallel to the busting well central axis;

(b) a lower die assembly including:

(i) a lower busting die defining a transverse elongated busting die cavity extending transverse to the busting well central axis, the lower busting die being disposed in the busting well; and,

(ii) a split ring die removably disposed in the finishing well which split ring die defines an axially elongated die cavity therein extending generally along the finishing well central axis, the split ring die cavity having a relatively wide end and a relatively narrow end and having a projection generally transverse to the finishing well

central axis for defining a recess in an elongated surface in a forged part; and,

(c) an upper die assembly which includes:

(i) an upper busting die for mating with the lower busting die cavity to coact therewith to preform a billet received therein; and,

(ii) a finishing punch disposed opposite the finishing well for selectively entering the split ring die cavity wide end and displacing the preformed billet into conformity with the split ring die cavity.

4,559,805

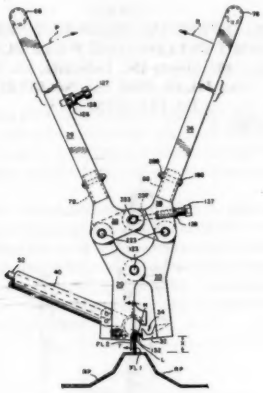
HAND SEAMER

Richard R. McClure, Basehor, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Sep. 28, 1984, Ser. No. 655,623

Int. Cl.[4] B21D *17/02*

U.S. Cl. 72—384 **17 Claims**



1. A hand seamer tool for use in seaming roof panels together comprising:

a double pair of pivotally interconnected body elements;

actuating members for applying pressure simultaneously on both sides of two roof panel flanges which are abutting each other side-by-side to form a first interlocked seam between said adjacent roof panels;

anvil means mounted on said body elements for directly engaging the roof panel flanges;

limit means for pre-adjusting the amount of force which can be exerted on said anvil means by said actuating members;

forming means for making a further seam of said roof panel flanges after said first seam has been completed by said device;

said means for making a further seam after said first seam has been completed including a traversely extending forming bar mounted on said body elements which can be rotated about its longitudinal axis for performing a double seaming operation by device; and

said forming bar having actuating tube means associated therewith, which actuating tube means also is provided with a lock therefor, and wherein said lock comprises a latch plate having a catch projection extending therefrom together with release means with said forming bar for disengaging said latch plate as appropriate.

4,559,806

BLIND RIVET SETTING TOOL

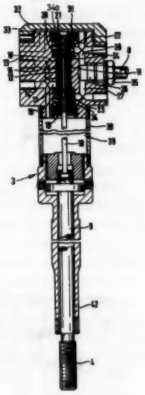
Manfred F. Schwab, Wiesbaden, Fed. Rep. of Germany, assignor to Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co., Froendenberg, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,417

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308915

Int. Cl.[4] B21D *9/05*

U.S. Cl. 72—391 **12 Claims**



1. A blind rivet setting tool for setting a threaded rivet nut, comprising a threaded pin engageable with a said nut for the riveting operation, a rotating means adapted to rotate said threaded pin selectively for screw engagement and disengagement of said nut, a means adapted to impart an axial movement to the threaded pin for the rivet upsetting operation, and a means for actuating said rotating means in a first direction for screwing said pin to said nut in response to an axial pressure on said pin toward said nut and for actuating said rotating means in a second direction for unscrewing said pin from said nut automatically in response to a release of said axial pressure on said pin by movement of said head away from said nut.

4,559,807

PRESS

Oleg A. Ganago; Anatoly V. Safonov; Boris A. Stepanov; Vadim N. Subich; Alexandr D. Frolov, all of Moscow; Nikolai A. Lobanov, Moskovskaya; Yakov L. Lumer, Moskovskaya; Alexei M. Xenofontov, Moskovskaya; Leonid I. Rudman; Alexandr D. Lebed, both of Kiev; Vazha I. Mamatsashvili, Tbilisi; Valery F. Kljuchnikov, Moskovskaya; Dzhemal I. Birkadze, Tbilisi; Sergei S. Shklyarman; Nikolai A. Gordeev, both of Moskovskaya; Jury A. Bocharov, Moscow; Vasily Y. Golovin, Voronezh; Alexandr T. Kruk, Voronezh; Ivan F. Yakovenko, Voronezh; Vladimir V. Novikov, Voronezh; Andrei M. Grishkov, Moscow; Valery N. Gorozhankin, Voronezh; Jury N. Sergeev, and Vladimir E. Svistunov, both of Moscow, all of U.S.S.R., assignors to Zavod-Vtuz Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva and Moskovskoe Vysshee Tekhnicheskoe Uchilische Imeni N. E. Baumana, both of Moscow, U.S.S.R.

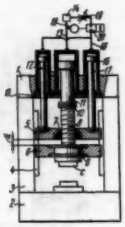
Filed Jun. 23, 1983, Ser. No. 507,078

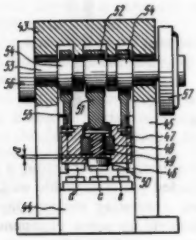
Int. Cl.[4] B21J *9/18*

U.S. Cl. 72—454 **7 Claims**

1. A press comprising two crossheads spaced some distance apart one from another; uprights adapted to interconnect said crossheads; said crossheads and uprights forming a frame of said press; a first ram mounted between said uprights for translatory movement relative thereto; a nut with a non-self-stopping thread carried in said first ram; a first drive for translatory

motion of said first ram; a second ram mounted for translatory movement between said uprights; a die holder rotatably mounted in said second ram for translatory motion therewith and for rotation; a screw rigidly connected to said die holder and operatively connected with said nut, thereby forming therewith a kinematic couple; a second drive operatively connected to said screw to enable its translatory motion jointly with said second ram; means for interconnecting said first





drive and said second drive to cause said second drive to become operative after said first drive and after the achievement of a predetermined stamping force in a workpiece; said first and second rams being initially in spaced relationship with a clearance formed therebetween sufficient to permit a specified angle of rotation of said die holder during translatory motion of said first ram relative to said second ram wherein said nut is caused to move toward said die holder.

4,559,808

GAS/LIQUID SEPARATOR AND ATOMIZATION CELL

Barry T. Sturman, Mulgrave, Australia, assignor to Varian Techtron Pty Limited, Mulgrave, Australia

Filed Jan. 28, 1985, Ser. No. 695,581

Claims priority, application Australia, Feb. 3, 1984, PG 3458/84

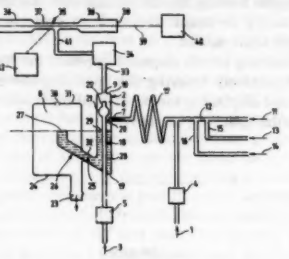
Int. Cl.[4] G01M *31/00*

U.S. Cl. 73—23 **28 Claims**

21. A method of separating gas and liquid including the steps of:

introducing a gas/liquid stream into a chamber so as to impinge against an upwardly extending tube provided in that chamber, said tube being arranged to encourage adhesion thereto of the liquid component of said gas/liquid stream,

introducing carrier gas into an upper region of said chamber through said tube, and exhausting said carrier gas and the



gas component of said gas/liquid stream through an upper end of said chamber.

4,559,809

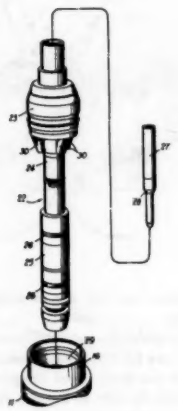
PROCESS OF TESTING BLOW-OUT PREVENTER WITHOUT PULLING THE WEAR BUSHING

John H. Mayo, 404 Alonda Dr., Lafayette, La. 70503

Filed Jul. 18, 1984, Ser. No. 632,021

Int. Cl.[4] G01M *3/28*

U.S. Cl. 73—40.5 R **4 Claims**



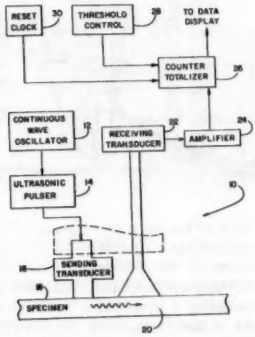
1. A process of testing a blow-out preventer and simultaneously testing well casing below the wear bushing for wear without pulling the wear bushing, comprising running a test tool assembly having spaced elastic ring seals and metal seal containment rings into a well and landing the assembly on a support surface of the wear bushing with the test tool extending into the bore of the well casing immediately below the wear bushing, dropping a fluid delivery dart through drill pipe into the test tool assembly until the dart is seated on an internal support surface of the test tool, pressurizing the drill pipe and dart to a pressure above the test pressure required to test the blow-out preventer and maintaining such pressure until the testing of the blow-out preventer is completed, relieving pressure on the drill pipe, retrieving the dart and test tool assembly, and then inspecting the condition of the metal seal containment rings of the test tool to determine the existence of and degree of wear in the bore of the well casing.

4,559,810

METHOD FOR DETERMINING RESIN VISCOSITY WITH ULTRASONIC WAVES

Richard J. Hinrichs, Cerritos, and Judy Thuen, Capistrano Beach, both of Calif., assignors to Applied Polymer Technology, Inc., Carlsbad, Calif.

Division of Ser. No. 281,877, Jul. 9, 1981, Pat. No. 4,455,268.
This application Jun. 15, 1984, Ser. No. 621,052
Int. Cl.⁴ G01N *11/00, 29/02*
U.S. Cl. 73—54 **8 Claims**



6. A process for monitoring the viscosity of a resin substrate of a fiber-reinforced composite material undergoing a final curing step during which the composite material is subjected to a time-varying temperature, the process comprising the steps of:

irradiating the composite material with an ultrasonic wave, at least the root mean square amplitude of which is known; and

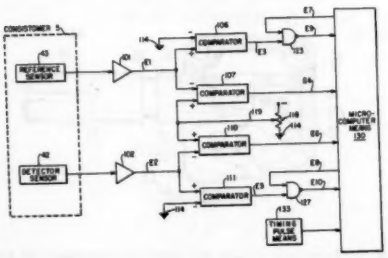
sensing at least the root mean square amplitude of the ultrasonic wave after it has travelled through at least a portion of the composite material, and thereby obtaining a value which has a linear relationship to the logarithm of the instantaneous viscosity of the resin.

4,559,811

CONSISTOMETER

Kenneth O. Higgs, and Jimmy D. Everett, both of Port Neches, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 21, 1984, Ser. No. 612,505
Int. Cl.⁴ G01N *11/14*
U.S. Cl. 73—59 **6 Claims**



1. A consistometer for continuously measuring the consistency of a stream of material from apparatus manufacturing the material comprising:

a rotatable resilient member located in said stream;

means for rotating said member at a constant rate about an axis which is parallel to the direction of flow of said stream;

a reference member;

means for rotating the reference member in synchronism with the resilient member;

resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member;

reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member;

means for providing a start pulse and a stop pulse in accordance with the resilient member signal and the reference member signal and not to noise, said start and stop pulse means includes:

means for providing a biasing voltage,

first noise signal means connected to the reference member sensing means and to the biasing means for providing a first noise indication signal representative of whether the resilient member signal is noise or indicative of the movement of the resilient member, and

second noise signal means connected to the resilient member sensing means and to the biasing means for providing a second noise indication signal representative of whether the resilient member signal is noise or indicative of the movement of the resilient member;

means for providing timing pulses;

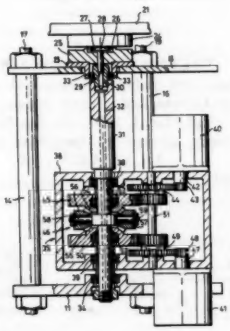
means connected to the start and stop pulse means and to the timing pulse means for determining the consistency of the material in accordance with the start and stop pulses and the timing pulses.

4,559,812

RHEOMETER AND METHOD OF USE THEREOF

Terence J. Kitchen, Surrey, England, assignor to SPRI Limited, Doking, England

Filed Jun. 8, 1984, Ser. No. 618,856
Claims priority, application United Kingdom, Jul. 15, 1983, 8319195
Int. Cl.⁴ G01N *11/14*
U.S. Cl. 73—59 **12 Claims**

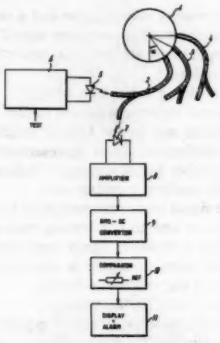


1. In a rheometer which includes means defining a chamber for holding a sample of material of which the properties are to be measured under pressure in said chamber, a rotor, said rotor including a surface in contact with said sample in said chamber, drive means for rotating said rotor, and torque measuring means for measuring torque applied to said rotor as it is rotated, the improvements comprising: said drive means being reversible, and including a pulse-operated electric stepping motor, gearing connecting said motor to said rotor, and circuit means for supplying electrical pulses to said motor to rotate said motor and thereby rotate said rotor, said drive means enabling said rotor to be rotated selectively in either direction in steps of not more than 20 minutes of arc.

4,559,813
SYSTEM AND DEVICE FOR DETECTING THE FORMING OF DEPOT

Henricus J. P. M. Brekelmans, Eindhoven, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed May 10, 1984, Ser. No. 608,881
Claims priority, application Netherlands, May 11, 1983, 8301701
Int. Cl.[4] G01N *31/02*
U.S. Cl. 73—61.4 9 Claims

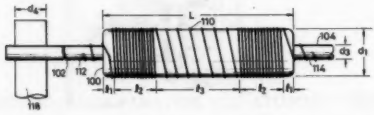


1. System for detecting the forming of depot inside a transport channel for transporting particles in a light transparent carrier fluid, comprising a light transmitter, a light receiver, a bifurcated glass fibre cable of which the joint end is installed within the wall of a transport channel, one branch of the cable fork being coupled to the light transmitter and the other branch being coupled to the light receiver, and the output of said light receiver being connected to a discriminator circuit comprising a convertor for converting the effective ac voltage component in said received signal into a dc voltage component and a comparator in which said dc voltage signal is compared with a predetermined threshold signal.

4,559,814
THERMAL AIR FLOW METER

Kanemasa Sato, and Sadayasu Ueno, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,194
Claims priority, application Japan, Mar. 7, 1983, 58-35957
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—118 4 Claims

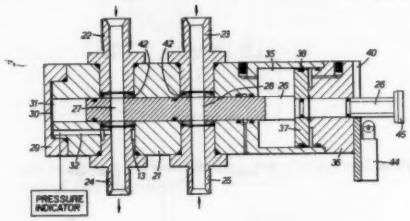


1. In an internal combustion engine a thermal air flow meter including a flow rate detector for detecting a proportion of a flow rate of air in dependence upon heat carried away by the air the flow rate detector comprising a support means, means disposed on said support means for increasing a response time of the thermal air flow meter and improving an accuracy of the measurement of flow rate including a heat-sensitive resistor formed on said support means in such a manner that the resistance per unit length of said heat-sensitive resistor at either end of said support means is greater than the resistance per unit length of said heat-sensitive resistor at a center of said support means, and leads attached to both ends of said support means and electrically connected to said heat sensitive resistor.

4,559,815
TESTING DEVICE FOR FUEL INJECTORS

Arthur M. Needham, Camberley, England, assignor to Tectron (ENG) Ltd., Surrey, England

Filed Feb. 6, 1984, Ser. No. 577,380
Claims priority, application United Kingdom, Feb. 8, 1983, 8303407
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A 16 Claims

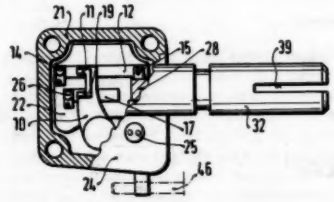


1. A method of testing a fuel injector of the type having a fuel discharge passage, a tip sealing valve capable of sealing the passage to control the discharge of fuel therethrough, and means for defining a path for the circulation of fuel therealong, said path including a port which lies adjacent the discharge passage, said method comprising the steps of sealing the discharge passage by the tip sealing valve; circulating fuel along said path by way of fuel supply and fuel return lines connected thereto; closing the fuel supply and fuel return lines to retain the path of the injector and the fuel lines in communication therewith full of fuel; and attempting to introduce a predetermined quantity of fuel into one of the fuel lines which is in communication with the path of the injector, the success or failure of said attempt to introduce fuel indicating the presence or absence, respectively, of fuel leakage from the injector.

4,559,816
DISPLACEMENT TRANSDUCER FOR DETECTING THE POSITION OF AN ADJUSTING DEVICE

Rolf Ebert, Lauffen; Peter Knorreck, Weissach; Manfred Krämer, Schwieberdingen, and Wilfried Merkel, Kappelrodeck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 591,135
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313715; Apr. 15, 1983, 3313716; Oct. 28, 1983, 3339077
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A 24 Claims

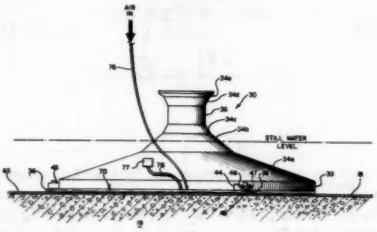


1. A displacement pickup for detecting positions of an adjusting device of fuel injection pumps, comprising a housing which receives said adjusting device, a through bore in a wall of said housing, a movable pickup part actuated by said adjusting device and a stationary pickup part disposed on a carrier, a tang disposed on said carrier in which the tang is displaceable in said through bore in said wall of the housing which receives the adjusting device and said tang is flexible therein.

4,559,817
HYDRODYNAMIC TEST APPARATUS WITH OFFSHORE STRUCTURE MODEL USING GAS BAG SEAL AT MODEL BOTTOM

Erik E. Brogren, Wheaton, and Subrata K. Chakrabarti, Plainfield, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 23, 1984, Ser. No. 572,820
Int. Cl.[4] G01M *10/00*
U.S. Cl. 73—148 **24 Claims**

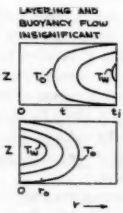


1. Apparatus for testing a model of a gravity-based offshore structure, and obtaining data therefrom for predicting the effects of hydrodynamic forces caused by waves on a full size structure, said test apparatus comprising a model, a wave tank having bottom, side, and end walls and being adapted to contain a predetermined quantity of water, means for generating waves in said tank, support means carried by the bottom of said tank for supporting said model therein, the underside of said model being substantially flat and spaced above the bottom of said tank when supported by said support means so that a gap is defined between said flat underside and said tank bottom, said support means including at least one load cell having an output proportional to changes in the load on and displacement of said model in at least one direction, and means for filling and sealing the gap between the bottom of said model and the bottom of said tank for preventing hydrodynamic forces from acting on the underside of said model during testing, whereby the test data obtained from said load cell is rendered more accurate and reliable.

4,559,818
THERMAL WELL-TEST METHOD

Chin-Fu Tsang, Albany, and Christine A. Doughty, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1984, Ser. No. 583,451
Int. Cl.[4] E21B *47/06*
U.S. Cl. 73—154 **10 Claims**



1. A well-test method for determining characteristics of a groundwater aquifer or geothermal reservoir, comprising the steps of:

determining at least the horizontal permeability and storativity of an underground water containing area to be tested;

installing temperature indicating means at different depths in at least one observation well located within the area to be tested;

injecting into the water containing area a specified amount of water at a temperature different from the water in the area being tested;

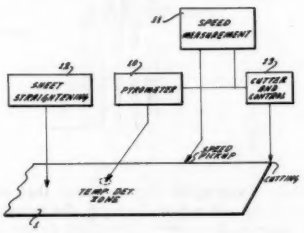
during injection of the water, obtaining temperature readings at different depths from the observation well; and

plotting the temperature distributions for determining the general characteristics of the water containing area, heat capacity, porosity, effective thermal conductivity, permeability anisotropy and layering characteristics.

4,559,819
SELECTING THE CUT-OFF END PORTION OF ROLLED SHEET STOCK

Gerd-Joachim Deppe, Duisburg; Hans H. Ettwig, Rheinberg; Heinz Schneider, Düsseldorf, and Wolfram Hof, Mülheim, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 17, 1983, Ser. No. 495,153
Int. Cl.[4] B21B *37/10*; G01J *5/02*
U.S. Cl. 73—159 **3 Claims**



1. Method of automatically selecting the length of an end portion to be cut off, of a thermo mechanically rolled sheet or plate stock under consideration of admissable yield point values, there being a straightening step provided to follow the rolling of sheet stock, comprising the step of

contactless measuring, the velocity and the surface temperature of the sheet stock without physical engagement and immediately following the straightening and obtaining a temperature profile from the velocity and temperature measurements;

determining and selecting the length of the end to be cut off the sheet, on-line and in dependence upon the progressively acquired surface temperature profile; and

cutting off an end portion as so determined and selected.

4,559,820
DEVICE FOR THE CHECKING OF A SPRING FROM A REMOTE LOCATION

Francis Zava, Manosque, and Louis Coppa, Aix En Provence, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

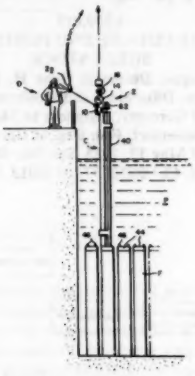
Filed Jun. 6, 1983, Ser. No. 501,712
Claims priority, application France, Jun. 14, 1982, 82 10317
Int. Cl.[4] G01N *3/26*; G01L *1/04*
U.S. Cl. 73—161 **11 Claims**

1. A device for the measurement from a remote location of the characteristic of a spring of the type having a fixed portion and deflectable portion, said device having means for applying known loads to said deflectable portion of the spring and means for measuring the corresponding deflection thereof, in which the means for applying the known loads are constituted by:

a series of known masses displaceable vertically, each of the masses forming said series being loosely linked to the other masses of the series and movable relative to one another so that, upon lowering them, said masses are successively supported by the spring;

means for determining when, during the descent of said series of masses, each mass of said series of masses rests on said deflectable portion of the spring;

the means for measuring the deflection of the spring are constituted by the means for indicating to said remote location the displacement of the mass then resting on the deflectable portion of the spring relative to a reference point fixed with respect to said fixed portion of the spring, wherein the means for determining when a mass of said series of masses rests on the spring are constituted by a



vertically displaceable dynamometer that provides an indication to said remote location, the system of masses being suspended on the hook of the dynamometer; and wherein said series of masses is comprised of three masses, respectively:

a first elongated mass suspended by its upper part on the dynamometer and having a shoulder at its upper end;

a second elongated mass positioned beneath the first mass and suspended on the lower part of the latter with an axial clearance; and

a third mass formed as a hollow tubular column in which are arranged said first and second masses, said hollow tubular column having upper and lower ends and an inner shoulder, by which it rests on the shoulder of the first mass, when the series of masses is suspended.

4,559,821

HIGH PRESSURE TRANSDUCER

Paul Engeler, Frauenfeld, and Peter Wolfer, Andelfingen, both of Switzerland, assignors to Kistler Instrumente A.G., Winterthur, Switzerland

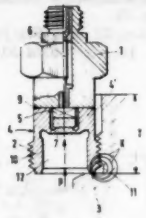
Filed Apr. 4, 1983, Ser. No. 481,881

Claims priority, application European Pat. Off., Apr. 6, 1982, 82102929.5

Int. Cl.⁴ G01L *9/08*

U.S. Cl. 73—167 **19 Claims**

1. A high pressure transducer for ballistic application having an externally threaded portion and operable to be threadably secured directly in a mounting aperture having an internally threaded portion and provided in a ballistic structural component, comprising a body member provided with said externally threaded portion, a sensor part connected with the body member and having a membrane portion, a sealing portion and a housing portion, said membrane portion serving to actuate a sensor element located within the housing portion of the sensor part, means adapted to form a shoulder seal between mutually abutting surfaces of the sealing portion and the mounting aperture, said seal being located ahead of the threaded portions, and further means in the transducer operable to substantially keep away from the membrane portion and housing portion, the force flux lines stemming from the tightening and sealing forces which are produced when sealing the transducer



relative to the structural component, said further means being formed at least in part by displacement of the housing portion and the membrane portion with respect to the sealing portion so that said force flux lines are substantially kept away from the housing and membrane portions.

4,559,822

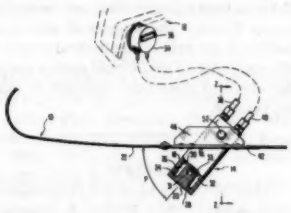
AIRCRAFT POTENTIAL OF WING LIFT INSTRUMENT AND METHOD

Morgan G. Huntington, P.O. Box 135, Galesville, Md. 20765

Filed Apr. 23, 1982, Ser. No. 371,450

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 73—178 R **10 Claims**



1. Potential of wing lift indicator instrument for aircraft of the type having fixed wings and a pilot compartment, comprising:

(a) an airstream sensing probe means including a pair of fixed vented plane surfaces,

(b) means fixing the vented plane surfaces to provide a fixed dihedral angle measured exteriorly from one surface to the other of greater than ½° relative to each other,

(c) means mounting the sensing probe means from the aircraft to protrude into a region of induced, incident, stable air flow, so that both plane surfaces are subjected to dynamic pressure of the induced, incident, stable air flow,

(d) means defining vent means in each of the pair of fixed vented plane surfaces,

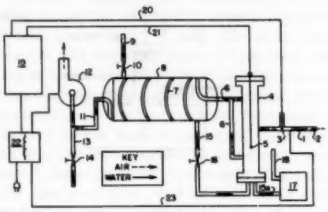
(e) a differential pressure measuring means including readout means positioned for viewing from the pilot compartment,

(f) fluid communication paths for placing the vent means and the differential pressure measuring means in fluid communication for measuring the differential of the dynamic pressure on the fixed plane surfaces of the sensing probe means.

4,559,823
DEVICE AND METHOD FOR MEASURING THE ENERGY CONTENT OF HOT AND HUMID AIR STREAMS

Howard N. Rosen; Albert C. Kent, and George F. Girod, all of Carbondale, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 30, 1984, Ser. No. 662,378
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[4] G01N *25/62*
U.S. Cl. 73—338 5 Claims



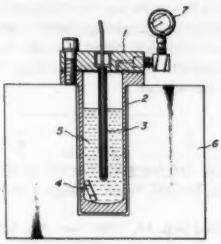
1. A process for measuring the humidity of a gas comprising,
drawing a sample of said gas through a first tube,
heating said tube to within a few degrees of the dry bulb temperature of the gas sample to prevent condensation within the tube,
measuring the dry bulb temperature of the sample,
delivering the sample to a housing and dividing it into two streams, said housing circumscribing a cylinder partially filled with water, said cylinder including supply ports, a wick being located on the exterior of said cylinder below said ports,
one of said streams flowing around said cylinder and wick and exiting from said housing through an outlet, the second of said streams flowing into said cylinder through an entrance and into contact with a wet-bulb wick circumscribing a wet-bulb sensing device,
measuring the wet-bulb temperature of the sample,
discharging the second stream from the cylinder and combining it with the first stream,
extracting heat from said combined streams and transferring it to the water to be delivered to the cylinder,
calculating the enthalpy of the sample.

4,559,824
CERAMIC TESTING METHOD

Takao Soma, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 24, 1984, Ser. No. 613,534
Claims priority, application Japan, Jun. 17, 1983, 58-107645
Int. Cl.[4] G01J *4/02*
U.S. Cl. 73—432 R 10 Claims

1. A ceramic testing method comprising the steps of heating a ceramic specimen containing tetragonal zirconia in water or a water vapor atmosphere containing not less than 2.5 g/l of water at a temperature in a range of 150°–1,250° C., for a time sufficient to result in deterioration of any non-stabilized zirconia that is present in said ceramic specimen, and measuring the

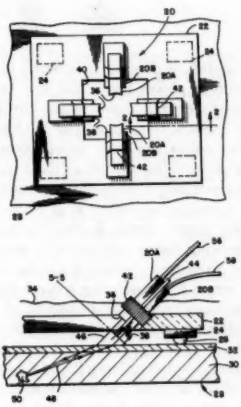


degree of deterioration of the ceramic specimen to evaluate long term durability and reliability of the ceramic specimen.

4,559,825
TRANSDUCER ARRAY FOR DETECTION OF SUBSURFACE FLAWS

George D. Martens, New Milford, Conn., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Feb. 15, 1984, Ser. No. 580,268
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 10 Claims



1. A transducer system for detection of flaws in the wall of a vessel carrying a liquid comprising:
plural sets of transducers which make a conversion between electric energy and sonic energy;
sled means for transporting said transducers along a surface of said wall covered by said liquid, the radiating surfaces of said transducers being submerged in said liquid, there being a layer of liquid between said radiating surfaces and said wall;
each of said sets including a transmitting transducer and a receiving transducer directed towards a common region of said wall, the transducer in each set being arranged in tandem;
said sets of transducers being supported by said sled means in a symmetrical array about said region of said wall;
electric circuit means coupled to said transducer for the generating and receiving of sonic energy signals for locating flaws in said wall; and wherein
in each of said sets, said transmitting transducer is inclined relative to a normal to said surface for directing radiation within said wall in a direction transverse to said normal

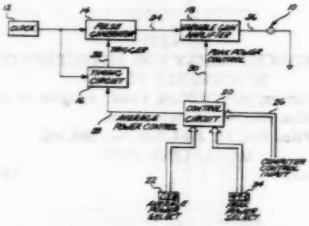
for detection of a flaw at a site distant from the location of said transmitting transducer, said transmitting and receiving transducers being disposed with parallel longitudinal axes located for receiving radiation reflected from said site along a direction generally parallel to an intersection of said surface with said plane, thereby to maximize a combined beamwidth of said transmitting transducer and said receiving transducer.

4,559,826

PRECISION SOURCE OF ACOUSTIC RADIATION

Craig E. Nelson, Seattle, Wash., assignor to TAB Leasing, Seattle, Wash.

Filed Sep. 14, 1984, Ser. No. 650,806
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—632 **9 Claims**



1. An apparatus for generating acoustic radiation of selected peak and average power levels, the apparatus comprising an acoustic transducer and drive means for providing a drive signal to the acoustic transducer, the drive signal comprising a series of drive pulses, the drive means comprising:

means for establishing a series of fixed length clock cycles;

means for generating a series of trigger signals such that each trigger signal occurs either R or S clock cycles after the preceding trigger signal, R and S being positive integers;

pulse generating means responsive to each trigger signal to produce a selected number of standard pulses;

amplifier means for generating a drive pulse in response to each standard pulse, the amplitude of each drive pulse being adjusted such that the peak power of the acoustic radiation is equal to the selected peak power level; and

control means for determining R and S such that the average power of the acoustic radiation is approximately equal to the selected average power level at the selected peak power level.

4,559,827

ULTRASONIC SHEAR WAVE COUPLANT

David S. Kupperman, Oak Park, and Ronald N. Lanham, Lockport, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

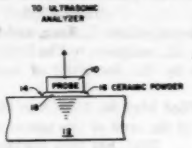
Filed Apr. 11, 1984, Ser. No. 599,108
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—644 **7 Claims**

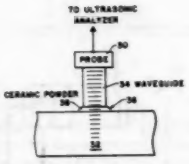
1. A method of ultrasonically testing a metallic or ceramic article at temperatures in the order of about 300°–1000° C. comprising the steps of

providing an ultrasonic transducer capable of generating a shear wave,

ultrasonically coupling the ultrasonic transducer to a surface of the article through a thin compact layer of a dry ceramic powder, the ceramic powder having a modulus of elasticity about 25% below that for silicon carbide,

propagating a shear wave from the transducer through the ceramic powder and into the article to develop echo signals, and





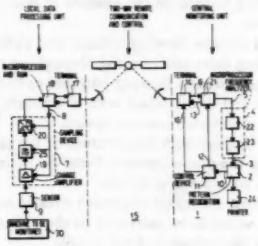
analyzing the echo signals to determine at least one physical characteristic of the article.

4,559,828

SYSTEM FOR OPERATIONAL MONITORING OF A MACHINE

Ludwik J. Liszka, Parkvägen 4, 910 36 Sävar, Sweden

Filed Jun. 26, 1984, Ser. No. 624,593
Claims priority, application Sweden, Jul. 1, 1983, 8303785
Int. Cl.[4] G01N *29/00*; G08C *19/00*
U.S. Cl. 73—658 **6 Claims**



1. In a system adapted for monitoring the condition of a machine by vibration analysis, and wherein the machine has a characteristic frequency spectrum when operating normally, said system including at least one vibration sensor in operative contact with said machine for sensing machine vibrations, and providing a vibration signal at its output, sampling means connected to the output of said vibration sensor, said sampling means including an amplifier, a low pass filter postcoupled to said amplifier, and an A/D converter postcoupled to said filter for sampling, amplifying and digitizing the signal obtained from said vibration sensor, separate frequency analysis means arranged to receive the sampled and digitized signal from said sampling means for frequency analysis thereof, and pattern recognition means coupled to said frequency analysis means for detection of any abnormal frequency spectra corresponding to abnormal machine operation, the improvement comprising

local data processing means near said machine adapted to store programs for the control thereof, being connected to said vibration sensor, and including a microcomputer inclusive of a random access memory, being arranged for obtaining vibration data from said sensor, and for storing

said vibration data in the form of a time series in said memory, said local data processing means also including said sampling means,

central monitoring means remote from said local data processing means adapted to store another program therein, and providing for monitoring and further processing of said time series, said central monitoring means including computer means, as well as said frequency analysis means, and said pattern recognition means, said computer means being connected to said frequency analysis means,

control means connected to said central monitoring means, and

a two-way communication link connecting said local data processing means and said central monitoring means

for periodic transmission of said time series from said memory in said microcomputer of said local data processing means in one direction to said frequency analysis means in said central monitoring means, and

for transferring said other program from said central monitoring means back to said local data processing means in a direction opposite to said one direction,

said control means providing for control of said amplifier, of said low pass filter, and of said A/D converter, through said communication link,

whereby transmission of said time series from said local data processing means to said central monitoring means can be matched to reception conditions prevailing at said central monitoring means.

4,559,829

DIFFERENTIAL PRESSURE TRANSMITTER FOR INDUSTRIAL PROCESS FLUIDS, PROVIDED WITH COMPENSATION OF STATIC PRESSURE CHANGE EFFECTS

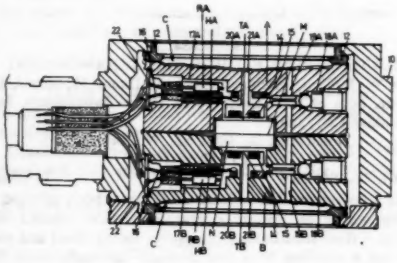
Gianfranco Bianchi, S. Fermo Della Battaglia; Riccardo Borelli, Tremezzo, and Piero Pierpaoli, Lenno, all of Italy, assignors to Kent-Tieghi S.p.A., Lenno, Italy

Filed Jun. 25, 1984, Ser. No. 624,514

Claims priority, application Italy, Jul. 8, 1983, 21983 A/83

Int. Cl.⁴ G01L *7/08, 9/04, 9/10*

U.S. Cl. 73—708 **4 Claims**



1. In a differential pressure transmitter of the type including a closed cell, a diaphragm dividing said cell into separate chambers, a liquid filling said chambers, means for applying different pressures to said liquid in said chambers and thereby causing a deflection of said diaphragm, and means in said chambers for converting said diaphragm deflection into an electrical output representative of the difference between said pressures, the improvement of means for compensating for static pressure changes of said different pressures, said compensating means comprising:

pressure sensitive means, located in at least one said chamber and separate from and independent of said converting means, for generating an electrical output as a function of changes in static pressure in said one chamber.

4,559,830

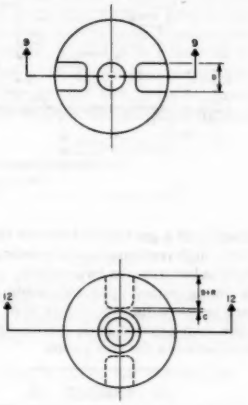
TESTING DEVICE FOR FASTENERS

Raymond Plummer, and Ilene Plummer, both of 522 Berkham, Napoleon, Ohio 43545

Filed Mar. 29, 1984, Ser. No. 594,739

Int. Cl.⁴ G01N *3/00*

U.S. Cl. 73—761 **7 Claims**



1. A testing device for fasteners, comprising a base member, a means to draw a fastener into tension, and at least one wedge means having a hole in it so that said means to draw a fastener into tension will put a tension on the fastener shaft resulting in bringing the fastener head into contact with the wedge means,

said wedge means has a wedge angle specifically calculated to result in elastic bending and a predicted load in a section of the fastener shaft when said means to draw a fastner into tension is used to apply the predetermined force,

the material of the wedge means is of sufficient strength to withstand the full tensil strength load of the fasteners and be heat treated to a minimum hardness of Rockwell C50

said means to draw the fastener into tension is capable of being used to determine the degree of tension applied which is found in the relationship $L = U \frac{1}{4} (D)2(P)$ when L = induced load, U = ultimate tension strength, D = diameter, P = percentage chosen to meet the final fastener user requirement,

whereby a predetermined stress in the area of the fastener shaft near the fastener head is in theoritical eleastic deformation which will result in failure of the shaft if the actual material properities are of significantly lower grade then the theoritical predicted properities.

4,559,831

METHOD AND DEVICE FOR FLOW MEASUREMENT OF SMALL LIQUID VOLUMES

Karl Prestele, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 647,568

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334805

Int. Cl.⁴ G01F *1/708*

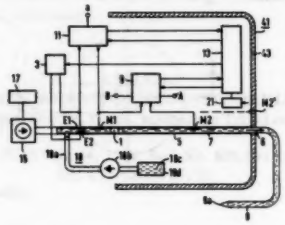
U.S. Cl. 73—861.05 **14 Claims**

1. A method for measuring small liquid flow volumes passing through a tube-like conduit in which a gas bubble is introduced, the longitudinal flow time of the bubble being measured between two points on the conduit which are separated from each other by a predetermined distance, the diameter of the bubble being approximately equal to the inside diameter of the

conduit and the flow rate being determinable from the flow time, comprising the steps of:

measuring the electrical resistance between the two points on the conduit;

characterizing the resistance as a one of two categories which include a relatively low resistance corresponding



to an absence of a gas bubble between the two points and a relatively high resistance corresponding to a presence of a gas bubble between the two points;

starting a timing period upon measuring a relatively high resistance between the two points; and

stopping the timing period upon measuring a relatively low resistance between the two points.

4,559,832

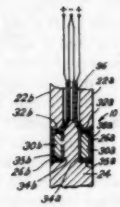
PIEZOELECTRIC PRESSURE FREQUENCY SENSOR

Brian J. Burlage; David E. Wiklund, and Gary A. Lenz, all of Marshalltown, Iowa, assignors to Fisher Controls Company, Inc., Marshalltown, Iowa

Continuation-in-part of Ser. No. 311,542, Oct. 15, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 534,979

Int. Cl.[4] G01F *1/32*; G01L *7/08, 9/08*

U.S. Cl. 73—861.24 **25 Claims**



1. A sensor adapted to sense a frequency of pressure fluctuations in a dynamic fluid, the sensor comprising:

a sensor body having a sensor chamber including an exterior chamber opening and a solid interior chamber surface spaced opposite the opening;

a transducer assembly including a piezoelectric transducer located in the sensor chamber, seated against the solid interior chamber surface, and having an end extending from the sensor chamber through and beyond the chamber opening; and

a diaphragm mounted on the sensor body and sealing the chamber opening, the diaphragm being preloaded against the transducer assembly to hold the transducer assembly against the interior chamber surface in preloaded compression while the diaphragm is held in preloaded tension by the transducer assembly, and the diaphragm being formed to conform to the contour of the end of the transducer assembly and to conform to the contour of the sensor body adjacent the transducer assembly such that the diaphragm is in physical contact with the transducer assembly and the sensor body substantially completely throughout the extent of the diaphragm and such that pressure fluctuations outside the chamber against the diaphragm cause compression fluctuations in the piezoelectric transducer which cause the piezoelectric transducer to responsively generate an electrical signal representative of the frequency of the pressure fluctions.

4,559,833

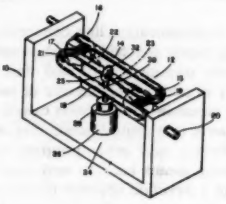
METER FOR MEASURING MASS FLOW RATE

Anatole J. Sipin, New York, N.Y., assignor to Smith Meter Inc., Erie, Pa.

Continuation of Ser. No. 428,736, Sep. 30, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 655,305

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **12 Claims**



1. A dynamic vibratory meter for measuring the mass of material flowing therethrough, including,

an S-shaped conduit, with a longitudinal axis, having three co-planar legs, an inlet leg with its inlet end connected to a support, an outlet leg with its outlet end connected to the support, and a return leg, connecting the inlet and outlet legs,

means to vibrate the conduit in a direction transverse to the plane of the three legs, providing an increasing gradient of transverse velocity, and, therefore, transverse momentum of the flowing material, between the inlet and a maximum velocity point along the return leg, and providing a decreasing gradient of transverse velocity, and, therefore, transverse momentum of the flowing material, between the maximum point and the outlet, and

means for sensing the vibratory force couple on the conduit about an axis perpendicular to the direction of vibration due to the transverse momentum as a measure of the mass flow through the conduit.

4,559,834

MULTIPURPOSE FLOWMETER ARRANGEMENT

James W. Phillips, Michigan City, and Duane M. Kobos, La-Porte, both of Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Aug. 30, 1984, Ser. No. 645,680

Int. Cl.[4] G01F *1/00*

U.S. Cl. 73—861.55 **14 Claims**

1. In a flowmeter that includes an elongate body adapted to be disposed in an upright operative position relation and defining a float tube having oppositely facing front and rear sides and a tapering bore that diverges upwardly from the float tube base to the top of the float tube, a float in said float tube with the body having a first tublar mounting stud at the base of the float and a second tubular mounting stud at the top of the float tube, said mounting studs projecting rearwardly of said body and each defining a bore and an outwardly projecting end portion,

the improvement wherein:

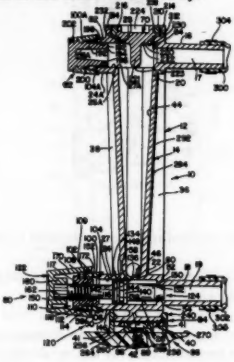
said body defines a first valve chamber at the base of said float tube that is aligned with the bore of the first mounting stud and that is defined by a first substantially cylindrical wall and an annular valve seat that are in coaxial relation, with said first cylindrical wall extending forwardly at said body and defining a passage aligned with said float tube bore for fluid flow communication with same,

said body further defining a second valve chamber at the top of the float tube that is aligned with the bore of the

second mounting stud and is defined by a second substantially cylindrical wall and an annular valve seat that are in coaxial relation, with said second cylindrical wall extending forwardly of said body,

one of said cylindrical walls have secured to same at the front side of same and in coaxial relation thereto a sleeve that extends forwardly of said body and defines an internal thread of a predetermined hand,

with the other of said cylindrical walls receiving a plug including means for sealing off the valve chamber aligned therewith at the front of said body.



and said sleeve threadedly receiving a nut having an internal threading of the hand that is opposite that of said predetermined hand,

and including a valve member threadedly received in said nut and including a valve stem projecting into the valve chamber defined by said one cylindrical wall and mounted for threaded movement toward and away from the annular valve seat defined by same for opening and closing the valve defined thereby,

said valve member having a stop flange disposed rearwardly of said nut for precluding removal of said valve member from said nut,

and means for threadedly moving said valve member relative to said nut to open and close said valve.

4,559,835

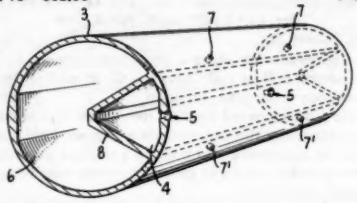
FLOW MEASURING TRAVERSE PROBE

Kenneth W. DeBaun, Santa Rosa, Calif., assignor to Air Monitor Corporation, Santa Rosa, Calif.

Continuation-in-part of Ser. No. 522,338, Aug. 11, 1983, abandoned. This application Feb. 15, 1984, Ser. No. 580,347

Int. Cl.⁴ G01F *1/46*

U.S. Cl. 73—861.66 **9 Claims**



1. A traverse probe for measuring the bulk flow of an air or gas stream comprising

a cylindrical tube disposed transversely with respect to the direction of stream flow to develop a pressure distribution around the exterior tube surface which includes a zone of positive total pressure at the tube wall facing the direction of flow and separated zones at the tube wall of static pressure only adjacent to and on each side of the zone of positive total pressure;

a spaced set of total pressure ports in the tube wall aligned substantially with the direction of bulk flow in said zone of positive total pressure, said total pressure ports being chamfered at their inlet end facing into the stream flow with a chamfer angle *in the range of* 45°–60°;

a first spaced set of static pressure ports in the tube wall aligned in one of the zones of static pressure only;

a second spaced set of static pressure ports in the tube wall aligned in the other zone of static pressure only; and

two separate conduits formed within the wall of the tube, one manifolding all of the total pressure ports in communication with one another and the other manifolding in communication with one another all of the static pressure ports.

4,559,836

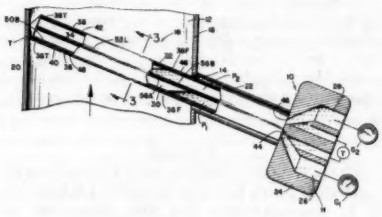
PITOT TYPE FLOW MEASURING DEVICE AND METHOD OF MOUNTING

Darrel F. Coleman, Longmont, and Morris M. Bond, Louisville, both of Colo., assignors to Dieterich Standard Corp., Boulder, Colo.

Filed Oct. 17, 1984, Ser. No. 661,703

Int. Cl.⁴ G01F *1/46*

U.S. Cl. 73—861.66 **6 Claims**



1. In a pitot tube type flow measuring device of the type having a tubular body of other than circular cross section with a head on one end and a closed tail end on the other, means for attaching same to a pipe such that the tail end thereof is impacted by a fluid flowing inside the pipe and the head end lies outside, a partition wall extending lengthwise of said body dividing its interior into two isolated plenums, a separate passage in the head end connected into each of the plenums and connectable to externally-located instrumentation for indicating the pressure in the latter, at least one port opening into each of the plenums spaced along that portion of the body that will be located within the stream of flowing fluid, one of said ports being positionable to face upstream and be impacted by the flowing fluid, and the other of said ports facing downstream and lying in the wake of the fluid flowing past the body, the improvement which comprises: the upstream-facing portion of the body impacted by the flowing fluid is shaped to include a convex rounded leading edge separating a pair of substantially planar portions diverging therefrom in a downstream direction that terminate in a pair of transversely-spaced substantially parallel side margins cooperating with one another to define flow separation zones effective to separate the fluid flowing thereover from said body, the upstream-facing ports are located in said leading edge, and said side margins are convexly curved about radii of a length no greater than 1/5th of the transverse distance therebetween.

4,559,837

FAECES COLLECTION AND CONCENTRATION RECEIVER

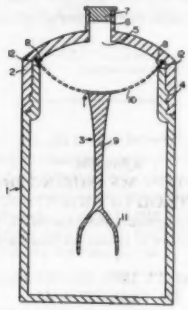
Francisco L. Cerqueira, Rua Itacolomi, 180 ap 112, Sao Paulo, Brazil

PCT No. PCT/BR82/00013, § 371 Date Nov. 2, 1983, § 102(e) Date Nov. 2, 1983, PCT Pub. No. WO83/01194, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 23, 1982, Ser. No. 548,193

Int. Cl.⁴ G01N *1/08*

U.S. Cl. 73—863.23 **11 Claims**



1. Faeces collection and concentration receiver for parasitological examination, comprising, in combination, a disposable semi-flexible receiver, a first cap (**2**) fastenable immediately to a mouth of the receiver (**1**), and one collecting-filtering device (**3**) coupled between the receiver (**1**) and the first cap (**2**), said first cap having a spout (**6**) closed by a second cap (**7**).

4,559,838

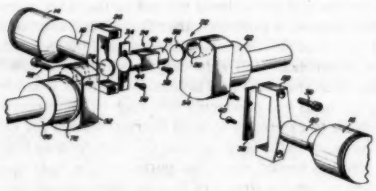
SCOTCH YOKE PISTON AND CRANKSHAFT CONNECTION WITH FLOATING CRANK PIN

Victor L. Neuenschwander, Box 1098, Bloomfield, N. Mex. 87413

Filed Oct. 6, 1983, Ser. No. 539,822

Int. Cl.⁴ F16H *21/18*

U.S. Cl. 74—50 **10 Claims**



1. In a scotch yoke-type connection between a reciprocatory rod and a rotary crankshaft having a crank pin which is received in an elongate guideway defined internally of a scotch yoke, and the rod is connected to the exterior of the scotch yoke, the improvement wherein the crank pin has a central portion of square cross-section having one pair of opposite surfaces received directly between opposed bearing surfaces of said guideway, and circular section end portions rotatably journalled in bearing openings formed in respective crankshaft flanges disposed on opposite sides of the yoke, and wherein the yoke comprises two mutually separable yoke members which, when separated, allow the crank pin to be rotated for receipt of the other pair of opposite surfaces of the crank pin between the bearing surfaces of the yoke.

4,559,839

APPARATUS FOR DRIVING AN OSCILLATING SPOUT

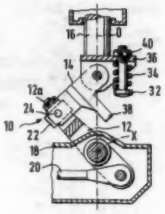
Edouard Legille, Luxembourg, and Emile Lonardi, Bascharage, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Jun. 15, 1983, Ser. No. 504,465

Claims priority, application Luxembourg, Jun. 24, 1982, 84224

Int. Cl.⁴ F16H *27/02*

U.S. Cl. 74—88 **18 Claims**



1. Apparatus for controlling the movement of an oscillating spout comprising:

a driving rod capable of rotation about its longitudinal axis and capable of axial displacement;

an intermediate lever arm connected at a first end to said driving rod by a pivotal connecting means;

a control arm to be connected to the oscillating spout;

universal joint means connecting a first end of said control arm to the second end of said intermediate lever arm;

torque generating means tending to reduce the angle formed between the longitudinal axis of said intermediate lever arm and the longitudinal axis of said control arm when said angle reaches 180°, said torque generating means including piston means connected between said driving rod and said intermediate lever;

flange means extending from said intermediate lever;

a shoulder extending from said driving rod;

piston means extending from said shoulder to said flange mean; and

spring means acting on said piston to urge said piston against said flange means, whereby said piston applies a torque to said intermediate lever arm when the angle between said intermediate lever arm and said control arm reaches 180°.

4,559,840

LIFTING APPARATUS

Toshihiko Sasaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00224, § 371 Date Feb. 14, 1983, § 102(e) Date Feb. 14, 1983

PCT Filed Jun. 10, 1982, Ser. No. 466,353

Claims priority, application Japan, Jun. 12, 1981, 56-87547[U]

Int. Cl.⁴ F16H *19/06*; B66B *7/04*

U.S. Cl. 74—89.21 **2 Claims**

1. An apparatus for lifting a load comprising:

a cylindrical hollow body having a slit formed in the wall of said body in an axial direction;

a guide plate mounted for axial movement within said body and extending through said slit to support said load;

a base for supporting said body in a vertical position;

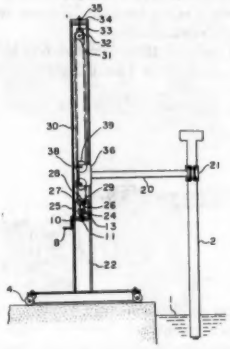
a first sprocket rotatably mounted within said body at the upper end thereof;

a second sprocket rotatably mounted within said body at the lower end thereof;

a first chain having both ends connected to opposite ends of said guide plate to form a loop, said loop being engaged with said first and second sprockets;

driving means within said body engaged with said second sprocket for turning said second sprocket to drive said chain, causing said guide plate to move along said slit and lift said load wherein said driving means comprises a

crank, a worm turned by said crank, a worm wheel driven by said worm, a third sprocket means coaxially mounted with and rotatable with said second sprocket, a fourth sprocket coaxial with and rotatable with said worm wheel, a second chain which is continuous to form a second loop with said second loop being engaged with said third sprocket and said fourth sprocket; and



a cylindrically shaped casing mounted inside said cylindrical hollow body wherein said cylindrically shaped casing houses said driving means so that only said crank protrudes outside of said casing and said hollow body.

4,559,841

GEAR TRAIN HAVING AN INTERNAL GEAR MECHANISM

Robert O. Chambers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

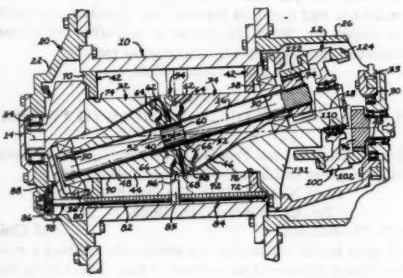
PCT No. PCT/US83/00152, § 371 Date Feb. 2, 1983, § 102(e) Date Feb. 2, 1983, PCT Pub. No. WO83/03291, PCT Pub. Date Sep. 29, 1983

Continuation-in-part of Ser. No. 648,231, Mar. 15, 1982, abandoned. This PCT application Feb. 2, 1983, Ser. No. 653,810

Claims priority, application PCT Int'l Appl., Mar. 15, 1982, US82/00320

Int. Cl.⁴ F16H *15/50, 37/06, 15/16, 15/00*

U.S. Cl. 74—191 **19 Claims**



1. In a gear train of the type having a body rotatable about a central axis, a first pinion gear rotatably mounted on the body on an inclined axis intersecting the central axis, and a second pinion gear rotatably mounted on the central axis, the improvement comprising:

internal gear means for transferring torque between the body, the first pinion gear and the second pinion gear, the internal gear means being rotatably mounted on the body on a nutating axis maintained generally between the central axis and the inclined axis.

4,559,842

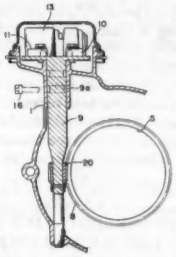
MOUNTING SETUP OF GOVERNOR SHAFT

Hiromi Taguchi, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 21, 1983, Ser. No. 544,207

Int. Cl.⁴ F16H *5/46*

U.S. Cl. 74—336.5 **9 Claims**



1. An automatic transmission comprising:

governor valve means for producing a governor pressure,

a governor driving member driven by a torque transmitted through the transmission,

a transmission case,

a governor shaft rotatably supported on said transmission case for supporting and rotating said governor valve assembly, said governor shaft being connected with said governor driving member so that rotation of said governor driving member causes said governor shaft to rotate, said governor shaft being formed with an annular groove which encircles the axis of said governor shaft, and has a bottom, and first and second side walls, said first and second side walls being flat, and

a stopper pin for preventing said governor shaft from being axially extracted from said transmission case and allowing said governor shaft to rotate, said stopper pin having first and second cylindrical portions and a middle portion lying between said first and second cylindrical portions, said first and second cylindrical portions being rotatably supported by said transmission case, said middle portion being received in said annular groove so as to limit the axial movement of said governor shaft, said middle portion having at least one flat face capable of abutting on one of said first and second flat side walls.

4,559,843

COUPLING MEMBER FOR MECHANISM FOR CONVERTING LINEAR TO ROTARY MOTION

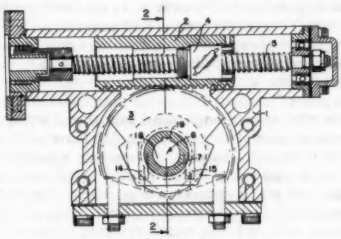
Sven W. Nilsson, Partille, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Sep. 20, 1982, Ser. No. 419,825

Claims priority, application Sweden, Nov. 6, 1981, 8106580

Int. Cl.⁴ F16H *19/04, 55/12*

U.S. Cl. 74—451 **2 Claims**



1. A device for performing a rotary motion comprising a first member rotatably mounted in a housing (1) or the like and detachably connected to a rotatable machine element, a cou-

pling element (7) detachably inserted in a bore of said first member (3) and rotatably mounted in the housing on rolling bearing assemblies, said coupling element (7) having cylindrical portions (10,11) extending on opposite sides of said first member (3) of a diameter no greater than the diameter of said bore and defining inner raceways for the rolling elements of said rolling bearing assemblies, and means for detachably fastening said coupling element (7) to said first member (3) including means defining at least a pair of recesses (X,Y) on either side of said coupling element (7), each of said recesses having a radially directed supporting surface and screw fastener means (15,16) engaging in said recesses with said radially directed supporting surfaces, said recesses located between said cylindrical portions (10,11) and formed radially into said coupling element (7) such that said recesses are radially within said diameter of said cylindrical portions (10,11).

4,559,844

SINGLE-LEVER STRAIGHT-LINE MOTION DEVICE FOR SINGLE, DOUBLE AND CROSSED DRIVE ON HYDRAULIC PILOT DEVICES

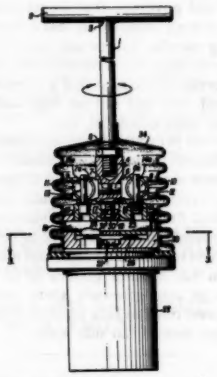
Pietro Mor, Imola, Italy, assignor to Hidroben S.p.A. Componenti ed Impianti Oleodinamici, Casalfiumanese, Italy

Filed Jun. 23, 1982, Ser. No. 391,463

Claims priority, application European Pat. Off., Apr. 23, 1982, 82830109.3

Int. Cl.⁴ G05G *9/04*

U.S. Cl. 74—471 R **7 Claims**



1. A single lever straight line device capable of being operated by a single lever and being supported on a piloting device body by means of a support fork projecting from a top side of said piloting device body, said piloting device body including at least four pushers extending from a top side of said piloting device body, said lever being rotatably disposed with respect to said piloting device body and with respect to a longitudinal axis of said lever, said straight line device including:

(a) a pair of cams rotatably disposed with respect to said piloting device body, each said cam for operatively contacting a respective pair of said pushers;

(b) a pair of pin members, each housed within a respective said cam and protruding upwardly from a top surface of said cam in which it is housed;

(c) a pair of elongated elements disposed along an oblique axis relative to a longitudinal axis of said lever, said elongated elements being constrained to move with said lever, said elongated elements transmitting movement of said lever to said pin members housed within said cams, such that said pin members undergo congruent motion with respect to said elongated elements, said elongated elements and said pin members being rotatably disposed relative to said piloting device body, each said pin member having a fork-shaped portion and each said elongated element having fork-shaped end portions of each end thereof; and

(d) first and second spherical elements, each having a first circumferential groove housing a said fork-shaped end portion of a said elongated element and a second circumferential groove housing a said fork-shaped portion of a said pin member.

4,559,845

TRANSMISSION MECHANISM

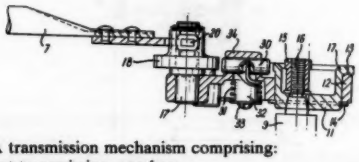
Norman H. Fallows, Crewe, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Apr. 24, 1984, Ser. No. 603,337

Claims priority, application United Kingdom, Apr. 28, 1983, 8311609

Int. Cl.⁴ F16C *3/28*; F16H *21/20*

U.S. Cl. 74—600 **10 Claims**



1. A transmission mechanism comprising:

a first transmission member;

an eccentric rotatably mounted in said first transmission member;

a first means for preventing relative rotation of said first transmission member and said eccentric when said eccentric rotates in a first direction, said means including a locking member and a formation in said eccentric in which said locking member is operative to engage;

a second transmission member rotatably mounted on said first transmission member; and

a second means for preventing relative rotation of said first transmission member and said second transmission member when said eccentric rotates in an opposite direction to said first direction, said second means including said locking member of first means and a formation in said second transmission member in which said locking member is operative to engage whereby in one operating mode of the transmission mechanism, said first transmission member may rotate eccentrically with said eccentric in said first direction and in a second operating mode of said transmission mechanism with said eccentric rotating in said opposite direction, relative rotational movement of said first transmission member and said second transmission member may be prevented and relative movement of said eccentric and said first transmission member is permitted to impart an additional throw to said first transmission member and said second transmission member.

4,559,846

SYSTEM FOR SHIFTING A VEHICLE TO TWO OR FOUR-WHEEL DRIVE

Stephen C. Cochran, and Francis J. Terwoerds, both of Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 10, 1983, Ser. No. 550,316

Int. Cl.⁴ F16H *37/06*; B60K *17/34*

U.S. Cl. 74—665 GA **15 Claims**

1. A gear transfer assembly for selectively shifting a power driven vehicle between a two-wheel or four-wheel drive mode comprising a casing incorporating a power input shaft,

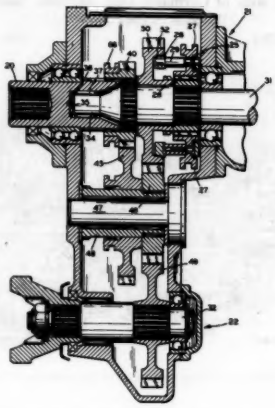
a first output shaft for a first pair of wheels and a second output shaft for a second pair of wheels,

means for connecting said input shaft and said first output shaft in power driven relation for driving the first two wheels of the vehicle,

a gear set comprising three constant mesh gears including an output gear for said first wheels mounted in freely rotatable relation on said first output shaft, an intermediate idler gear having a meshed relation with said first output gear and an idler shaft on which said idler gear is mounted

and a second output gear for said second wheels fixed to said second output shaft having a meshed relation with said intermediate idler gear,

a synchronizer fixed to said first output shaft for rotation thereby, said synchronizer being engageable in driving relation with said first output gear whereby said gear set



and second output shaft can be driven by said input drive shaft through said first output shaft and,

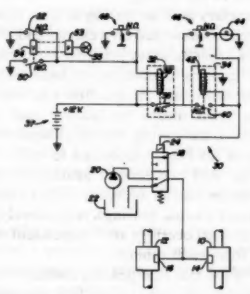
means for activating said synchronizer to effect its engagement with said first output gear whereby the assembly can be selectively shifted to drive the vehicle with either two or four-wheels.

4,559,847

STEERING PRESSURE-RESPONSIVE DIFFERENTIAL LOCK CONTROL SYSTEM

Bruce C. Newendorp, Cedar Falls; Terry L. Sturtz, Waterloo, and Lawrence V. Anderson, Cedar Falls, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 13, 1983, Ser. No. 503,970
Int. Cl.[4] F16H *1/44.5, 1/44*
U.S. Cl. 74—710.5 **6 Claims**



1. In a vehicle having an hydraulic steering system including a steering valve, axle shafts driven through a differential and locking means for locking and unlocking the differential, a differential lock control system comprising:

operator-controlled switch means coupled to the locking means for causing the locking means to lock and unlock the differential in response to operator-actuation thereof; and

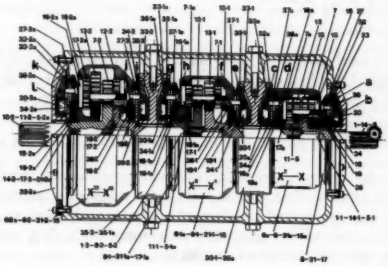
steering-responsive switch means connected to the locking means and to the steering valve for responding to a predetermined fluid pressure in the steering valve to cause the locking means to unlock the differential when it is locked, the steering valve comprising a conductive housing connected to a ground potential having a bore therein and a conductive valve spool movable in the bore, and the steering-responsive switch means comprising a conductive plunger mounted in an end of the valve housing, insulating means for electrically isolating the plunger from the housing, means for electrically coupling the plunger to the locking means, the plunger having an end face engageable with the valve spool to complete a circuit between the locking means and the ground potential thereby unlocking the differential.

4,559,848

INCREMENTALLY VARIABLE TRANSMISSION

John H. Kerr, P.O. Box 40, R.R. 1, Kingston, Ontario, Canada K7L 4V1

Filed May 6, 1982, Ser. No. 375,742
Claims priority, application Canada, Apr. 8, 1982, 400794
Int. Cl.[4] F16H *3/44, 37/00*
U.S. Cl. 74—750 R **22 Claims**



1. A binary logic incrementally variable transmission including a casing, and comprising either a sequence of biratio stages, a sequence of quadriratio stages, or a combined sequence of biratio and quadriratio stages: with a biratio stage having an input component, an output component, and a reactive component; said input component, said output component, and said reactive component being so interrelated that when said reactive component is coupled to said casing by an incorporated binary coupling means a 1st ratio-state greater than unity will result, and when said reactive component is coupled to said input component by said binary coupling means a 2nd ratio-state of unity will result; with said ratio-states defined as a ratio of input/output rotational speed: with a quadriratio stage having an input component, an output component, and two reactive components; with said input component, said output component, and said two reactive components, so interrelated that when said two reactive components are coupled to said casing by a first and a second binary coupling means incorporated respectively on each, a 1st ratio-state greater than unity will result; and when a reactive component of said two reactive components with a first binary coupling means incorporated is coupled to said input component with said second reactive component coupled to said casing a 2nd ratio-state equal to two-thirds the root of said 1st ratio-state will result; and when said second reactive component of said two reactive components with said second binary coupling means incorporated is coupled to said output component with said first reactive component coupled to said casing a 3rd ratio-state equal to one-third the root of said 1st ratio-state will result; and when both said reactive components are coupled respectively to said input and output components a 4th ratio-state of unity will result; with said ratio-states defined as a ratio of input/output rotational speed: when said transmission comprises said se-

quence of biratio stages, said 1st ratio-states of said sequence of stages are expressed by the equation;

$$r_{1,2} = [X^{2n-1}]_0^1;$$

as with a first biratio stage where n=1 a 1st ratio-state is of the order of X; as with a second biratio stage where n=2 a 1st ratio-state is of the order of X^2, in geometric progression X, X^2, X^4, X^8, X^16, X^32, etc.; so that when said sequence of biratio stages are permuted in all combinations of product a ratio-state between said input component of a first stage and said output component of a last stage in said transmission will be of the order of a geometric progression X^0, X^1, X^2, X^3, X^4, etc., with a value of X in said geometric progression defined by R a maximum combination of permuted product of n stages as in 1,2,3,. . . n−1,n, of said transmission, and expressed by the equation;

$$X = R\left[\frac{1}{2^n - 1}\right];$$

with a total number of ratio-states T between said input component of said first stage and said output component of said last stage in said transmission expressed by the equation;

$$T = 2^n;$$

when said transmission comprises said sequence of quadriratio stages, said 1st, 2nd, 3rd and 4th ratio-states of a quadriratio stage are a permuted product of equivalent adjacent pairs of biratio stages of said geometric progression X, X^2, X^4, X^8, X^16, etc., and expressed by the equation;

$$r_{1,2,3,4} = [X^{2n-1}]_0^1 * [X^{2n}]_0^1;$$

as with a first quadriratio stage where said equivalent adjacent pair of biratio stages are n=1 and n+1=2 said four ratio-states are respectively of the order of X^3, X^2, X and unity; as with a second quadriratio stage where said equivalent adjacent pair of biratio stages are n=3 and n+1=4 said four ratio-states are respectively of the order of X^12, X^8, X^4, and unity; as with a third quadriratio stage where said equivalent adjacent pair of biratio stages are n=5 and n+1=6 said four ratio-states are respectively of the order of X^48, X^32, X^16, and unity; etc.; with said 1st ratio-states of said sequence of quadriratio stages being of the order of a geometric progression X^3, X^12, X^48, X^192, etc.; so that when said sequence of stages are permuted in all combinations of product a ratio-state between said input component of a first stage and said output component of a last stage in said transmission will be of the order of said geometric progression X^0, X^1, X^2, X^3, X^4, etc.; and, when said transmission comprises said combined sequence of biratio and quadriratio stages, said 1st, 2nd, 3rd and 4th ratio-states of a quadriratio stage are a permuted product of any equivalent adjacent pair of biratio stages of said geometric progression X, X^2, X^4, X^8, X^16, etc.; as when n=2 and n+1=3, said four ratio-states are respectively of the order of X^6, X^4, X^2 and unity; as when n=4 and n+1=5, said four ratio-states are respectively of the order of X^24, X^16, X^8 and unity; so that when said sequence of stages are permuted in all combinations of product a ratio-state between said input component of a first stage and said output component of a last stage in said transmission will be of the order of said geometric progression X^0, X^1, X^2, X^3, X^4, etc.

4,559,849

POWER SHIFT PLANETARY GEAR TRANSMISSION

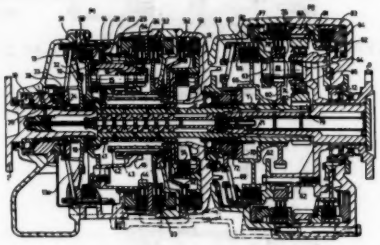
Karl-Gustav Ahlén, Bromma; Per-Olof Bergström, Nacka, and Hans A. Wallgren, Vällingby, all of Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Stockholm, Sweden

Filed Jun. 23, 1981, Ser. No. 276,492

Claims priority, application United Kingdom, Nov. 13, 1980, 8036495; Fed. Rep. of Germany, Dec. 24, 1980, 3048990

Int. Cl.[4] F16H 57/10

U.S. Cl. 74—761 **16 Claims**



1. A multi-speed transmission, comprising:

a casing;

first and second series connected planetary gear sets, an output shaft of the first set operatively connected to an input shaft of the second set;

each planetary gear set comprising a planetary pinion carrier which comprises an output member of its planetary gear set, a plurality of planetary pinions mounted in each said carrier;

each pinion of the first gear set having at least two different gearing diameters having different gear ratios, an input centrally disposed gear meshing with one of the gearing diameters and at least two other centrally disposed gears meshing one with each of the gearing diameters, a brake means for braking each of said other centrally disposed gears relative to the casing;

the second planetary gear set having at least first and second gearing diameters mounted on a carrier and differing from each other, a separate input sun gear for each of said first and second gearing diameters, at least two ring gears meshing one with each of the first and second gearing diameters, a brake means for braking each of said ring gears relative to the casing, the input shaft of the second planetary gear set being connected to each of said input sun gears, the first and second gearing diameters being journalled on the carrier independently of each other on first and second journal bearings, respectively, which first and second journal bearings are independent of each other and spaced from each other;

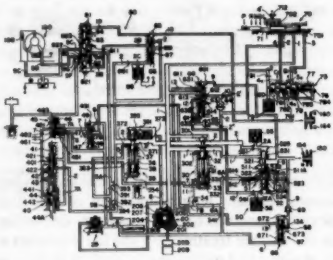
the gear ratio of the said first gearing diameter being greater than the largest gear ratio of the first planetary gear set, and the gear ratio of the said second gearing diameter exceeding the gear ratio of the said first gearing diameter by an amount which also exceeds the largest gear ratio of the first planetary gear set, and wherein the carrier of the second planetary gear set forms a hub portion coaxial with each planetary pinion, a journal bearing for the large gearing diameter being mounted on said hub portion, and said hub portion including a central axial opening, at least a portion of the journal bearings for the smaller gearing diameter located in said opening.

4,559,850

STEPLESS AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Shiro Sakakibara, Anjo, Japan, assignor to Aisin-Warner, Ltd., Aichi, Japan

Filed Nov. 28, 1983, Ser. No. 555,596
Claims priority, application Japan, Nov. 30, 1982, 57-210809; Nov. 30, 1982, 57-210813
Int. Cl.[4] B60K *41/12*; F16H *11/06*
U.S. Cl. 74—868 15 Claims



1. A stepless automatic transmission for a vehicle comprising:

(a) a V-belt stepless transmission mechanism comprising:

(i) an input pulley having a first axially stationary flange and first axially movable flange:

(ii) input pulley hydraulic servo means for receiving a first fluid pressure and for moving said first axially movable flange relative to said first axially stationary flange to vary the effective diameter of said input pulley responsive to changes in said first fluid pressure;

(iii) an output pulley having a second axially stationary flange and a second axially movable flange;

(iv) output pulley hydraulic servo means for receiving a second fluid pressure and for moving said second movable flange relative to said second stationary flange to vary the effective diameter of said output pulley responsive to changes in said second fluid pressure; and

(v) a V-belt passing around said input and output pulleys for transmitting torque from said input pulley to said output pulley; and

(b) a hydraulic control system comprising:

(i) reduction ratio control means for selectively supplying primary line pressure to said input pulley hydraulic servo or bleeding pressure therefrom, thereby varying the reduction ratio of said V-belt transmission mechanism;

(ii) a primary regulator valve for converting line pressure from a pressure source into said primary line pressure and for regulating said primary line pressure responsive to change in one or more operating conditions of the vehicle;

(iii) a secondary regulator valve for converting line pressure from a pressure source into secondary line pressure, lower than said primary line pressure, responsive to change in one or more operating conditions of the vehicle;

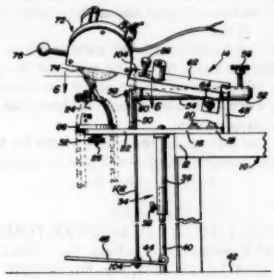
(iv) shift sequence means for supplying (1) secondary line pressure to said output pulley hydraulic servo when said input pulley hydraulic servo is supplied with fluid pressure higher than a predetermined value during normal and upshift operation of the vehicle and (2) primary line pressure to said output pulley hydraulic servo when said input pulley hydraulic servo is supplied with fluid pressure lower than the predetermined value during downshifting of the vehicle.

4,559,851

SAW CHAIN GRINDER

Jack F. Simington, Star Rte. Box 141, Chiloquin, Oreg. 97624

Filed Dec. 21, 1983, Ser. No. 564,481
Int. Cl.[4] B23D *63/16*
U.S. Cl. 76—40 13 Claims



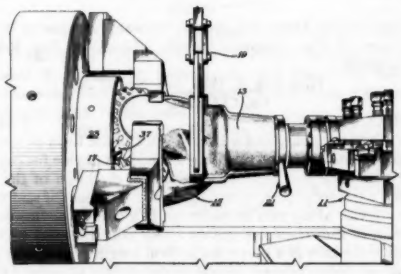
1. A chain sharpener including a generally horizontal elongated mounting member, mounting means on one end portion of said member for supportive mounting from a suitable support such as a bench or table with said mounting member projecting outwardly from one marginal portion of said bench, a depending leg carried by said mounting member and spaced there along from said one end portion toward the opposite end and including a lower end portion for supportive engagement with a lower support surface from which said bench is supported, a chain support structure supported from said opposite end, a tool head mounted from said mounting member for guided movement toward and away from said chain support structure, an elongated foot operable lever having one end pivotally attached to said lower end portion for swinging in a generally vertical plane paralleling said mounting member and with the other end of said lever facing in generally the same horizontal direction in which said opposite end of said mounting member faces, motion transmitting means operatively connected between said lever and head operative to displace said head toward said chain support structure responsive to downward displacement of said other end of said foot lever.

4,559,852

METHOD FOR SHANKING ROCK BITS

Gerald O. Atkinson, Pasadena, Tex., assignor to Hughes Tool Company-USA, Houston, Tex.

Filed Jun. 28, 1984, Ser. No. 625,479
Int. Cl.[4] B21K *5/02*
U.S. Cl. 76—108 A 3 Claims



1. A method of threading the shank end of a rock bit that has rolling cones, each supported on a cantilevered bearing shaft extending from the cone end of a head section with machined

faces joined with those of other mutually welded head sections to form a body, threaded at the upper end, the method comprising the steps of:

providing a locator means at the upper end of each head section in a predetermined relationship to the machined faces;

positioning the bit in a cone locator to engage the outermost teeth of each cone to position the cones on the design centerline of the bit;

mating a shank locator with the locator means;

inserting the tail stock of a lathe with the shank locator to hold the upper end of the bit about the design centerline;

energizing a compensating chuck to clamp the bit;

removing the tail stock;

machining the threads on the shank of the bit body;

releasing the compensating chuck and removing the bit.

4,559,853

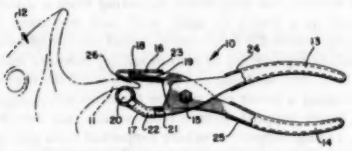
FISH LOWER LIP GRIPPER TOOL

Tom Oye, 2913 Carnaby La., Garland, Tex. 75042

Filed Jul. 23, 1984, Ser. No. 633,580

Int. Cl.[4] B25B *7/02*

U.S. Cl. 81—420 **8 Claims**



1. A fish lower lip gripper tool comprising: a pliers like tool having an upper jaw and a lower jaw connected to handles pivoted around a common pivot pin interconnection for operation of said upper jaw and said lower jaw toward each other in a gripping action and away from each other in a release movement in pliers like action; said upper jaw having a downward facing rounded gripping face; and said lower jaw having a transversely extended curved anvil and support surface transversely extended relative opening and closing movement of said upper and lower jaws; wherein said transversely extended curved anvil and support surface is transversely extended materially beyond the width of the downward facing rounded gripping face of said upper jaw; and wherein said transversely extended curved anvil and support surface is in the form of a length of round bar mounted on a lower jaw element shank.

4,559,854

CUTTING APPARATUS FOR STOCK IN THE FORM OF BARS

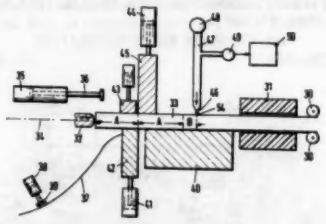
Heinz Jürgens, Unna, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,859

Int. Cl.[4] B23D *33/02*

U.S. Cl. 83—170 **7 Claims**

1. Cutting apparatus for heated stock in the form of metallic bars of finite length, comprising a transport device for moving the bars back and forth in longitudinal direction of the bars along a transport path, a heating device upstream of said transport device along said transport path, a cutting device downstream of said transport device along said transport path for cutting the bars to a given bar section length at a cutting position, a stop downstream of said cutting device along said transport path for limiting movement of the bars, a clamping device disposed between said cutting device and said stop along said transport path for holding bars of at least a given minimum remnant length in said cutting position, means in vicinity of said cutting device for carrying away cut bar sections and end remnants of bars out of said cutting position, a repulsion device in vicinity of said cutting device for moving the bar remnants into said heating device after cutting, a sensor disposed along said transport path for sensing presence and absence of the bars, said sensor having a sensing region disposed at a spacing



substantially equal to twice said given bar section length plus said minimum remnant length upstream of said stop, and a control device connected to said sensor for delivering control signals for the further treatment of the bar remnants as a function of the absence and presence of a portion of a bar section in said sensing region of said sensor.

4,559,855

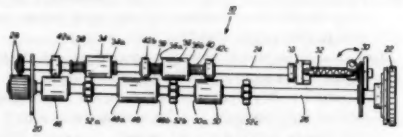
PLURAL MODE COPY SHEET OUTPUT SLITTER

Richard A. Schieck, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 23, 1984, Ser. No. 633,760

Int. Cl.[4] B26D *1/14*

U.S. Cl. 83—425.3 **1 Claim**



1. In a copier with a copy sheet output slitter for slitting the copy sheets outputted by the copier into a plural number of smaller sub-sheets cut in the direction of movement of the outputted copy sheets, the improvement wherein said output slitter provides and replaces the normal uncut copy sheet output transport of said copier by providing a positively driven copy sheet output transport path for both said cut and uncut copy sheet output, wherein said output slitter comprises a plurality of first generally cylindrical metal rollers rotatably driven on a first shaft and a second plurality of generally cylindrical metal rollers on a second shaft parallel to and spaced from said first shaft, said spacing and the diameters of said rollers being such that said first rollers interdigitate said second rollers, said first and second rollers having sharpened opposing radial end surfaces adapted to be selectably rotatably end-abutted against one another to form paper slitting shears between end-abutting first and second rollers, and mode selector means for automatically selectively end-abutting either selected ones, or none, of said first and second rollers by selective axial repositioning movement of one of said first or second shafts and the rollers thereon relative to the other rollers on the other said shaft for selectively forming one, or a selected number of, or no, paper slitting positions in the output path of the copier for providing a selected number of, or no, cut sub-sheets, wherein at least one of said rollers is an axially elongated cylinder which end-abuts another roller at one end thereof in one said selected paper slitting position and end-abuts a different roller at the opposite end thereof in another said selected paper slitting position, and wherein said rollers also define portions of

said copy sheet output transport by non-cutting engagement of the generally cylindrical surfaces of said rollers with said copy sheets, and wherein at least one of said first and second shafts also has rotatably driven deformable resilient frictional sheet feeding members positioned for non-cutting combination with said rollers, spaced from said end surfaces of said rollers, for providing said positive copy sheet output transport even for uncut flimsy paper sheets, of which at least one of said resilient frictional sheet feeding members is maintained in continuous sheet feeding nip engagement with only said cylindrical surface of at least one of said rollers in all said paper slitting or non-slitting positions of said mode selector means, and is axially repositionable along said cylindrical surface by said mode selector means, and wherein said mode selector means includes spring-loading means for automatically providing a preset and self-adjusting abutment force between said end-abutting rollers sufficient to maintain said selected paper slitting by said rotational abutment therebetween yet provide for uncritical axial repositioning of said rollers between modes by said mode selector means.

4,559,856

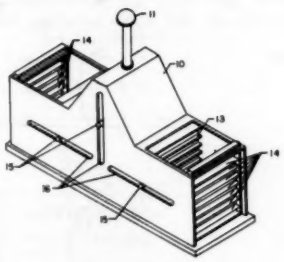
FOOD CUTTING DEVICE

Milton Pettus, P.O. Box 292, Merritt Island, Fla. 32952

Filed Jun. 16, 1983, Ser. No. 504,978

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—431 **1 Claim**



1. A cutting apparatus comprising: a housing having an elongated horizontal base with opposite ends; two parallel walls mounted on said base; two blade assemblies comprising a plurality of cutting blades having cutting edges, one blade assembly located at each opposite end of the base; two movers on said base, each mounted between said walls and slidable toward and away from a different opposite end, each mover having a loading position remote from and a cutting position adjacent one of the two blade assemblies; a handle located between the movers and moveable vertically within said housing; two arms, each pivotally mounted at one end to the handle and at the other end to one of the movers such that downward actuation to the handle causes the arms to simultaneously move the movers from the loading position toward the cutting position; spring means for continuously biasing the movers toward the loading position.

4,559,857

INDEXING ARRANGEMENT FOR THE TABLE OF A CHOP SAW

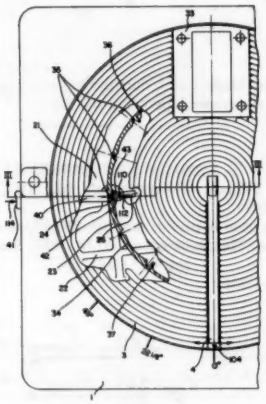
Horst Grossmann, Hünfelden; Rainer Herting, Langenhahn, and Horst Kaiser, Gräbengasse, all of Fed. Rep. of Germany, assignors to Black & Decker Inc., Newark, Del.

Filed Sep. 14, 1984, Ser. No. 650,899

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 8327663[U]

Int. Cl.[4] B27B *5/18*

U.S. Cl. 83—471.3 **14 Claims**



1. A chop saw, comprising:

a saw unit connected pivotably about a horizontal axis to a turntable mounted rotatably in a base plate about a vertical axis;

an indexing mechanism for releasably locating the turntable in any one of a plurality of specific rotational positions relative to the base plate; and

said indexing mechanism comprising:

(a) catch recesses provided on an underside of said turntable along a circular arc, the centre of said arc lying on said vertical axis;

(b) a leaf spring mounted on said base plate and having a free end which is engageable with any selected one of said catch recesses upon rotation of said turntable; and

(c) a release element mounted in said base plate and accessible from outside thereof, and operable to flex said leaf spring to move said free end out of engagement with any catch recess engaged thereby.

4,559,858

PORTABLE BAND SAW SAW MILL APPARATUS

Donald R. Laskowski, Indianapolis, and Daniel R. Tekulve, Batesville, both of Ind., assignors to Laskowski Enterprises, Incorporated, Indianapolis, Ind.

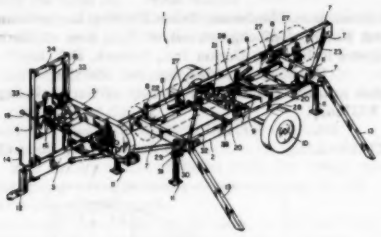
Filed Dec. 20, 1982, Ser. No. 451,100

Int. Cl.[4] B23D *55/08*

U.S. Cl. 83—801 **19 Claims**

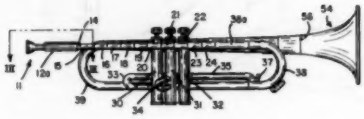
1. A portable bandsaw sawmill apparatus comprising an elongated frame, a track extending horizontally along only one side of the frame, a carriage including a support structure, first means for movably mounting the carriage on the track for horizontal movement therealong, a bandsaw having at least two wheels and a bandsaw blade entrained on the wheels, the bandsaw blade comprising a continuous band having transversely extending teeth, the frame including means for supporting a log, means for moving the carriage along the track, second means which cooperates with said support structure for

mounting the bandsaw on the carriage so that said bandsaw extends cantilevered therefrom and maintaining a portion of



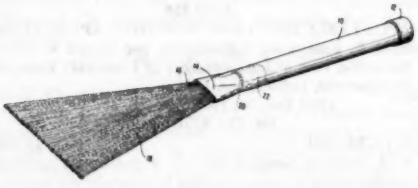
the bandsaw blade which cuts the log in a plane substantially parallel to the frame supporting the log.

4,559,859
MUSICAL INSTRUMENT
Eugene A. Pilczuk, 6986 Baumhoff Rd., NW., Grand Rapids, Mich. 49504
Continuation-in-part of Ser. No. 397,842, Jul. 13, 1982, abandoned. This application Jul. 18, 1983, Ser. No. 514,563
Int. Cl.[4] G10D *7/10*
U.S. Cl. 84—394 **7 Claims**



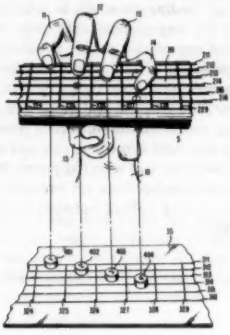
1. In a musical wind instrument of the type in which the pitch of the note to be produced is initially created by the person blowing the instrument, the instrument having at least one elongated tubular section forming a sound path with two ends, the improvement in the instrument comprising said section having twelve arranged in tandem, the length and diameter of each segment being progressively greater in the direction the sound travels through the section, the length of each segment corresponding to the wave length of a different note of a chromatic scale, the boundary between adjacent segments being formed by an abrupt change in diameter.

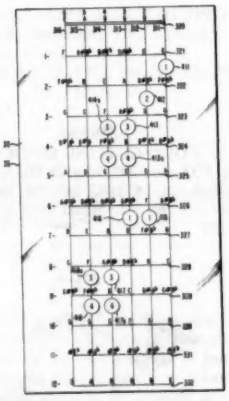
4,559,860
DRUM BRUSH
Charles Cordes, 27 Kenneth Pl., Clark, N.J. 07066
Filed Mar. 7, 1985, Ser. No. 709,248
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **5 Claims**

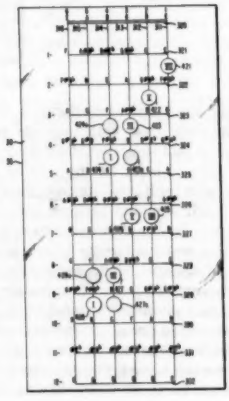


1. A drum brush comprising a hollow cylindrical handle member having one end thereof provided with a substantially oval-shaped opening, a plurality of coiled wire filaments of substantially equal length each having one end thereof extending into said hollow handle through said oval shaped opening and means for holding the ends of said filaments together within said hollow handle to prevent complete withdrawal of said filaments through said opening.

4,559,861
MUSICAL TEACHING DEVICE FOR EXPEDITING MUSICAL INSTRUCTION
Charles W. Patty, and Myron Weiss, both of New York, N.Y., assignors to Myron Weiss, New York, N.Y.
Filed Mar. 28, 1983, Ser. No. 479,851
Int. Cl.[4] G09B *15/02*
U.S. Cl. 84—470 R **19 Claims**







1. A musical teaching device comprising:

a base having a sheet of material with a grid appearing thereon, said grid representing the fingerboard of a stringed instrument having strings and frets, wherein said grid has a plurality of lines which represent the strings and a plurality of lines which represent the frets, each string line intersecting each fret line at a corresponding point of intersection,

a plurality of indicators positioned within said grid, wherein each indicator is fixedly situated in the vicinity of a corresponding one of said points of intersection and musically notates a particular musical note that would be obtained from that instrument by depressing the corresponding represented string against the corresponding represented fret at the corresponding point of intersection on the fingerboard of said instrument and simultaneously picking that string on the instrument,

a plurality of moveable markers, wherein each of said markers can be positioned anywhere on said grid and is visually identified by a symbol appearing on a top surface of that marker so that the placement of each of said markers over said grid indicates where on the fingerboard a corresponding string is to be depressed and said symbol on said marker represents musical information other than the name of a note.

4,559,862

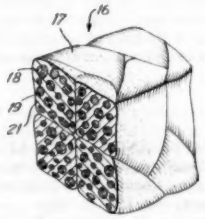
PACKING MATERIAL

Edward M. Case, Weston, and Chester S. Hopper, Newtown, both of Conn., assignors to The Marlo Company Incorporated, Newton, Conn.

Continuation-in-part of Ser. No. 133,049, Mar. 24, 1980, abandoned. This application Apr. 6, 1982, Ser. No. 366,107

Int. Cl.⁴ D06P *7/00*

U.S. Cl. 87—1 **33 Claims**



1. Compression packing, comprising at least two braided strands of a first fiber being an inorganic fiber and at least one of a second fiber being an organic, carbon or graphite fiber in combination, said braided strands impregnated with an impregnate including a binder for improving the sealant properties of the packing and said first fiber being an inorganic fiber selected from the group consisting of electrical-grade glass, structural-grade glass, high-strength glass, chemical-grade glass, ceramic and quartz fibers, said second fiber being selected from the group of an organic fiber selected from the group consisting of sintered polytetrafluoroethylene (TFE), polyethylene, polypropylene, aramid, nylon, rayon flax, ramie, hemp, jute and cotton, carbon and graphite fibers, the content of inorganic fiber in said combination being from 5 to 95 weight percent.

4,559,863

VALVE FOR A HYDRAULIC RAM

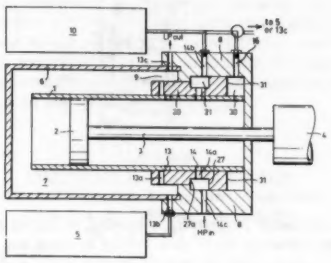
Robert B. Storey, Stowmarket, England, assignor to BSP International Foundations Limited, Suffolk, England

Filed Feb. 14, 1984, Ser. No. 580,555

Claims priority, application United Kingdom, Feb. 19, 1983, 8304691

Int. Cl.⁴ F15B *13/042*

U.S. Cl. 91—165 **9 Claims**



1. In a hydraulic ram of the type including a piston attached to an axially extending piston rod and journalled for axial movement within a cylinder defined within a cylinder wall under the influence of a fluid fed under pressure to said cylinder via a valving means for placing said cylinder in fluid flow communication with the fluid under pressure and to permit release of fluid from said cylinder upon completion of the stroke of said piston within said cylinder, the improvement wherein said valving means comprises:

a plurality of radial ports extending through said cylinder wall;

a valve block mounted at one end of said cylinder and having an end wall through which said piston rod is journalled;

a sleeve member mounted in sliding, sealing engagement with an outer surface of said cylinder wall, between said cylinder wall and said valve block, for axial movement with respect thereto;

said sleeve member having therethrough a plurality of radial ports adapted to align with respective said radial ports of said cylinder wall upon axial movement of said sleeve member with respect to said cylinder wall;

said sleeve member having formed therein a circumferential recess defined by two axially spaced radial walls, the effective radial area of one said radial wall located adjacent said end wall of said valve block being greater than the effective radial area of the other said radial wall;

a chamber defined within said valve block and limited by an end surface of said sleeve member, the effective radial area of said end surface being greater than the difference between said effective radial areas of said two radial walls;

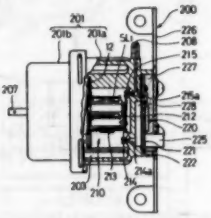
inlet port means, extending through said valve block and in communication with said recess at all relative axial positions of said sleeve member with respect to said valve block, for supplying fluid under pressure into said recess and thereby for causing said sleeve member to move in a first axial direction within said valve block; and

means for introducing fluid under pressure into said chamber and thereby for causing said sleeve member to move within said valve block in a second axial direction opposite to said first axial direction.

4,559,864
ACTUATOR

Naoji Sakakibara; Hiroyuki Amano, both of Kariya; Hiroaki Morioka, Toyota, and Shoji Kawata, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1984, Ser. No. 594,640
Claims priority, application Japan, Mar. 29, 1983, 58-52929
Int. Cl.[4] F15B *11/08*
U.S. Cl. 91—454 3 Claims

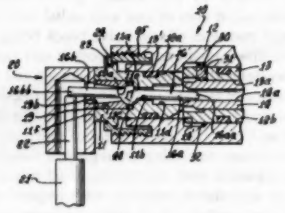


1. An actuator comprising a housing including a housing base and a housing cover each having an open end and connected to each other at their respective ends, a diaphragm adapted to divide the interior of said housing into a first internal space adjacent said housing base and a second internal space adjacent said housing cover, an actuator rod fixed to said diaphragm and extending through said housing, spring means adapted to push said diaphragm in a direction where one of said first and second internal spaces is increased and the other internal space is decreased, a printed circuit board having solenoid control circuit means thereon secured to said housing base and defining a third internal space between said printed circuit board and said housing base, first fluid pressure port means for imparting a first fluid pressure outside of said housing to said first internal space, second fluid pressure port means for imparting a second fluid pressure outside of said housing to said third space, third fluid pressure port means communicating said first internal space with said third space and solenoid valve means mounted in said housing for controlling communication of fluid pressure through said first and third pressure port means.

4,559,865
DEVICE TO TRANSFER MECHANICAL MOTION ACROSS FLUID BARRIER

Walter G. Gellerson, Yakima, Wash., assignor to Decoto Aircraft Inc., Yakima, Wash.

Filed Feb. 21, 1984, Ser. No. 582,005
Int. Cl.[4] F01B *25/26*; F16J *15/32*
U.S. Cl. 92—5 L 12 Claims



1. In a device for mechanical motion between a locking element in a hydraulic actuator to an external indication device, the combination comprising

(a) a housing defining a first generally longitudinally extensive passage, and a lock element in longitudinal alignment with said first passage,

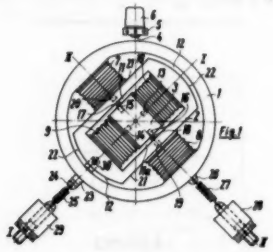
(b) a lever located to pivot in said first passage, the lever having first extent projecting toward said lock element which constrains pivoting of the lever,

(c) and means mounting the lever for said pivoting and defining a fluid barrier, whereby fluid at one side of the barrier closest to said first passage and lock element is isolated from communication with second extent of the lever at the opposite side of said barrier, and whereby sufficient motion of said locking element relatively away from said housing relieves said constraint of lever pivoting.

4,559,866
CROSSED-BELLOWS CONTROLLER

Paul Brenner, Steinheim, Fed. Rep. of Germany, assignor to Eckardt AG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,684
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015558
Int. Cl.[4] F01B *19/02*
U.S. Cl. 92—39 18 Claims



1. A controller comprising four bellows means arranged in a cruciform, a movable baffle ring means surrounding the bellows means, means for connecting the bellows means to the baffle ring means and a central supporting member, the connecting means includes a frameshaped cage member disposed within the baffle ring means for accommodating a first pair of the bellows means, the first pair of bellows means being connected to the central supporting member and to the cage member, a second pair of the bellows means are disposed externally of the cage member and connect the cage member to the baffle ring means.

4,559,867
ROUND DAMPER AND FUSIBLE LINK THEREFOR

Robert M. Van Becelaere, Johnson County, Kans., and William J. Bailey, Jackson County, Mo., assignors to Philips Industrial Components, Inc., Dayton, Ohio

Filed Jun. 29, 1984, Ser. No. 626,058
Int. Cl.[4] F16K *17/40*
U.S. Cl. 98—1 4 Claims

1. A fusible connector for use with a shaft operated fire damper to permit control of the damper closure position responsive to rotational torque applied to the shaft and to release the torque from the shaft permitting the latter to rotate for closing the damper when the temperature reaches a predetermined level, said connector comprising:

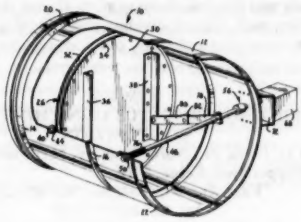
an element adapted to be rigidly secured to the shaft for rotation therewith, said element having a cylindrical bore therein extending in axial alignment with the shaft and projecting beyond the end of the latter, said bore being closed at one end with the open end of the bore facing outwardly from the end of the shaft;

a cylindrical member telescoped into the bore from the open

end thereof and having an outer surface concentric with the wall of the bore and slidable with respect thereto;

means carried by the member for securing the latter to a torque source for rotating the member about the shaft axis; and

solder means interposed between the member and the element normally intercoupling the same for rotation together as a unit under the influence of said torque, said solder means being meltable to permit relative rotation between the element and the member when the temperature reaches said predetermined level and being hardenable to reestablish the rigid connection between the element and the member when said temperature drops below the solidification temperature of said solder.



4,559,868

INSTRUMENT PANEL DEVICE FOR VEHICLES

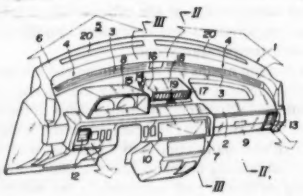
Toshihiko Nonaka, and Tetsuo Toda, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,098

Claims priority, application Japan, Mar. 1, 1983, 58-33250; Mar. 1, 1983, 58-33251; Mar. 1, 1983, 58-29603[U]

Int. Cl.⁴ B60H *1/00*

U.S. Cl. 98—2.08 **2 Claims**



1. An instrument panel device for a vehicle having a passenger compartment, a front wind shield fitted at the front end of said passenger compartment, a passenger's set placed in said passenger compartment, and an air conditioner for conditioning the air of said passenger compartment, comprising a base panel member having high rigidity, said base panel member being dimensioned to have substantially the same width as said passenger compartment, panel plate means attatched to said base panel member for defining therewith a defroster duct space, a wide flow duct space, and an air control duct space all adapted for the distribution of controlled air from said air conditioner, said defroster, wide flow, and air control duct spaces communicating with said passenger compartment through a defroster outlet directed toward said front windshield, a wide air outlet extending substantially over the entire width of said base panel member, and a plurality of spot air outlets directed toward said passenger's seat, respectively, said wide air outlet being formed in said base panel member, changeover means for alternatively selecting the distribution of said controlled air between said wide flow duct space and said air control duct space, a first partition wall separating said defroster duct space and said wide flow duct space from each other, a second partition wall separating said wide flow duct space and said air control duct space from each other, and said first and second partition walls forming integral parts of said base panel member; said changeover means comprising a communication part formed in said second partition wall for intercommunication between said wide flow duct space and said air control duct space, and damper means for closing and opening said communication part; said panel plate means having a hopout member fitted therein and arranged accommodatable in and exposable out of said air control space, one of said spot air outlets being formed in said hopout member, said damper means being interlocked with said hopout through a link mechanism such that said damper means opens said communication port formed in said second partition wall when said hopout member is accomodated in said air control duct space and closes said communication port when said hopout member is exposed out of said air control duct space.

4,559,869

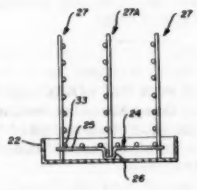
ADJUSTABLE BARBECUE RACK

Leroy Hogan, 412 Fairgreen, Youngstown, Ohio 44504

Filed Jun. 29, 1984, Ser. No. 626,295

Int. Cl.⁴ A47J *43/18*

U.S. Cl. 99—426 **3 Claims**



1. An adjustable barbecue rack for cooking spareribs comprising a main support base having elongated evenly spaced base wire support rods, at least one of which has a U-shaped bend therein, a plurality of cross support wires secured to said rods, a plurality of spaced aligned upstanding partitions carried by said main support base, at least one of said upstanding partitions removably positioned on said main support base, said partitions having a main support frame, a plurality of transversely extending secondary cross support rods secured thereto, means for supporting said main support base and said upstanding partitions carried thereby in elevated positions.

4,559,870

SYSTEM FOR THE TREATMENT OF WASTE PRODUCTS

Martin W. Krummacher, 3330 NE. Alberta Ct., Portland, Oreg. 97211; Lavon A. Harmon, 7026 N. Campbell Ave., Portland, Oreg. 97217, and Perry E. Clipfell, 427 W. Regis St., Stayton, Oreg. 97383

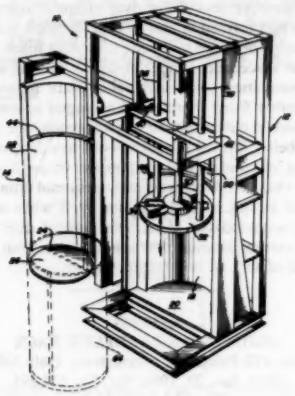
Filed Sep. 7, 1983, Ser. No. 530,089

Int. Cl.⁴ B30B *15/30*

U.S. Cl. 100—215 **6 Claims**

1. A waste compactor comprising a stationary frame having a cooperating pivotal door, the frame and door together defining a uniformly cylindrical compacting chamber when the door is closed, a reciprocatory compaction ram with a vertically reciprocable platen mounted on the frame above said chamber, a barrel support anvil associated with the door on which a barrel may be positioned for movement into and out of the compacting chamber, a horizontally protruding barrel protector ring segment on an internal compactor chamber-defining wall of the door and a complementary horizontally protruding barrel protector ring segment on an internal chamber-defining wall of the frame, said segments cooperating to define a barrel protector ring around the interior of the cham-

ber when the door is closed adapted to fit above the rim of a barrel in the chamber and protect the rim against damage by



the platen, said barrel protector ring protruding horizontally into the interior of said chamber.

4,559,871

INK DIVIDER FOR INK FOUNTAIN ROLLERS

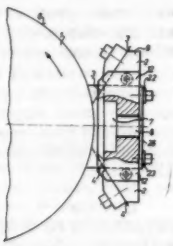
Willi A. P. Kutzner; Georg Schneider, both of Würzburg, and Thomas Kübert, Karlstadt-Karlburg, all of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,757

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320638

Int. Cl.⁴ B41F *31/04, 31/06*

U.S. Cl. 101—207 **3 Claims**



1. An ink dividing assembly for use in dividing an ink fountain roller of a rinse-type ink fountain having an ink reservoir whose front is sealed by the ink fountain roller in a rotary printing machine into a plurality of different color ink conveying areas, said ink dividing assembly comprising:

at least one inking bar positioned adjacent to, and extending longitudinally parallel to an axis of rotation of the ink fountain roller;

a guide plate secured to each end of said at least one inking bar, each of said guide plates having a guide depression cooperating with said end of said at least one inking bar to form a guide slot;

a thin ink dividing plate slideably carried in each of said guide slots, each of said ink dividing plates having a curved front surface having a thickness of between 0.03 mm and 0.3 mm and being adapted to engage the peripheral surface of the ink fountain roller, each said thin ink dividing plate being generally planar and being disposed in said guide slot generally perpendicular to the axis of rotation of the ink fountain roller, each said ink dividing plate further having a rear surface extending beyond rear surfaces of said inking bar and said guide plate; and

at least first and second leaf springs attached at first ends to said rear surface of said inking bar generally adjacent each said guide slot and having second, free ends contacting said rear surface of each said thin ink dividing plate to bias each said thin ink dividing plate against the ink fountain roller, each said ink dividing plate dividing the ink fountain roller into a plurality of ink conveying areas.

4,559,872

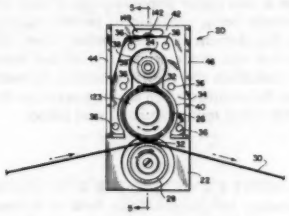
PRINTING APPARATUS USING HEATED INK COMPOSITION

Andrew G. Perra, Jr., North Swanzey, N.H., assignor to Markem Corporation, Keene, N.H.

Filed Apr. 30, 1984, Ser. No. 605,472

Int. Cl.⁴ B41F *13/02*

U.S. Cl. 101—228 **9 Claims**



1. A printing apparatus comprising:

a rotating printing member having at least one printing element thereon;

an inking roll for inking the printing element, said inking roll having a porous construction and being impregnated with an ink composition of the type which is solid at normal room temperatures and is rendered liquid or flowable at elevated temperatures; and

radiant heating means for maintaining the inking roll and the printing element on the printing member at elevated temperatures, said radiant heating means comprising a one-piece, substantially U-shaped member made of a solid block of thermally conductive material with one or more electrical heating elements therein, said U-shaped member having its closed end surrounding the inking roll and its open end partially surrounding the printing member.

4,559,873

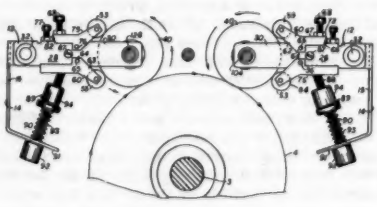
INKING ROLLER ASSEMBLY

Edward S. Godlewski, 129 S. Spruce St., Wooddale, Ill. 60691

Continuation-in-part of Ser. No. 385,574, Jun. 7, 1982. This application Apr. 30, 1984, Ser. No. 605,379

Int. Cl.⁴ B41F *31/26*

U.S. Cl. 101—329 **6 Claims**



1. For use with a driven printing device having a printing

face, a rotatable roller assembly comprising an inking roller having a body with an ink-releasing periphery adapted for association with said printing device which is mounted to move in wiping contact with said periphery of the inking roller to pick up ink on the printing face thereof, means connected to said body for rotationally driving said inking roller and including an impositive driving connection therethrough accommodating rotation of said inking roller overrunning its said driving means by said device wiping against said inking roller, a free rolling pumping roller pressed against the periphery of the inking roller and driven thereby, and said inking roller having a pair of end members seated against opposite ends thereof, said end members having peripheral edge portions spaced from the respective ends of the inking roller and defining therewith ink-receiving troughs recessed below the periphery of the inking roller to return to the ends of the inking roller ink expressed from the periphery of the inking roller by said pumping roller.

4,559,874

INK METERING SYSTEM IN LETTERPRESS AND OFFSET PRINTING MACHINES

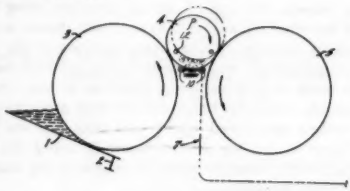
Siegfried Schuhmann, Offenbach am Main, and Günther Schniggenfittig, Muhlheim am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,794

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324445

Int. Cl.⁴ B41F *31/14*

U.S. Cl. 101—350 **3 Claims**



1. An ink metering system for use with letterpress and offset printing machines including an ink duct with a blade and a duct roller with an ink vibrator, the latter consisting of a plurality of ink vibrator discs, which oscillate individually and independently of one another between the duct roller and a transfer roller, and wherein the width of each of the discs corresponds to a specific ink zone, characterized in that the duct roller and the transfer roller are driven at the same circumferential speed, the ink vibrator discs being disposed loosely between the duct roller and the transfer roller and driven by frictional contact with the transfer roller and the duct roller while being normally in contact therewith; and means for selectively raising each of the ink vibrator discs out of contact with at least one of the duct roller and the transfer roller under controllably defined conditions by means of an actuating lever system including a lever for each vibrator disc and at least one support roller journalled on each lever for engaging the outer surface for raising the respective vibrator discs.

4,559,875

HIGH ENERGY SWITCHING CIRCUIT FOR INITIATOR MEANS OR THE LIKE AND METHOD THEREFOR

William F. Marshall, Belmont, Calif., assignor to Quantic Industries, Inc., San Carlos, Calif.

Filed Mar. 19, 1984, Ser. No. 591,202

Int. Cl.⁴ F42C *11/00*

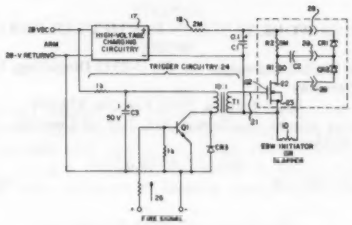
U.S. Cl. 102—218 **12 Claims**

1. A high energy switching circuit for initiator means or the like comprising:

a high voltage storage capacitor;

a plurality of series connected junction diodes all connected in a reverse direction across said capacitor and said initiator means to form a series circuit, each of said diodes having a reverse standoff voltage such that a greater voltage will result in irreversible damage thereto and destructive conduction with such diodes forming a low resistance current path;

a transistor switch having a control input and a pair of terminals which may be switched by said control input to off and on conditions, one of such terminals being connected to said initiator means and the other terminal to a midpoint between two of said diodes;



means for charging said capacitor to a voltage substantially equal to the sum of said reverse standoff voltages;

means for applying a signal to said control input to turn on said transistor and shunt one or more of said diodes so that said capacitor voltage is impressed upon the remaining diodes which is much greater than said standoff voltages to thereby place them in destructive conduction which in turn places the shunted diodes in destructive conduction to complete said series circuit with said capacitor and initiator means whereby a surge of current passes through said initiator means.

4,559,876

PENETRATOR PROJECTILES

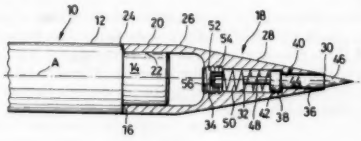
Jürgen Böcker, Oberhausen; Klaus W. Klein, Neuss, and Klaus Gersbach, Willich, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,132

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314752

Int. Cl.⁴ F42B *13/16*

U.S. Cl. 102—520 **2 Claims**



1. An improved penetrator projectile having high length to diameter ratio and being encompassed by a segmented sabot which separates from the projectile as soon as it exits from the muzzle of a gun barrel, the projectile comprising in combination,

a projectile body having a forwardly extending cylindrical portion;

a frusto-conically shaped nose portion having a rearwardly extending cylindrical portion which defines a first bore, said forwardly extending portion matingly extending into the first bore of said rearwardly extending cylindrical portion so that said nose portion and projectile body are coaxially mounted relative to each other;

said nose portion having an axial second bore extending

therethrough; said second bore having a front end which defines an annular forward edge in said frusto-conically shaped nose portion and also including front and rear stop means;

a pin having a pointed front end being axially movably mounted in said bore between front and rear stop means; biasing means being operatively mounted in said second bore for biasing said pin forwardly against said front stop means; said pointed front end of said pin forming a continuous cone with said frusto-conically shaped nose portion when said pin abuts against said front stop means and said pointed front end being fully retracted into said second bore when said pin abuts against said rear stop means.

4,559,877

CORNER WORK TABLE, IN PARTICULAR FOR OFFICE WORK

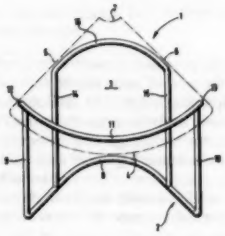
Walter Waibel, Schwaiger Str. 34, D-8312 Dingolfing, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,089

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3232017

Int. Cl.⁴ A47B *57/00*

U.S. Cl. 108—64 **42 Claims**



1. Corner work table, in particular for office work, comprising a subframe and a corner table top, characterized

in that the corner table top (3) has the form of a circular segment having two straight radius sides (5,6) and an arc side (4),

that at least in the region of the corners of the corner table top (3) vertically extending support legs (9,10) are disposed,

that the support legs (9,10) are connected to the corner table top (3) and to each other at a distance from the corner table top (3) by a member (8) open towards the arc side (4),

and that, substantially in the region of the centre of each of the radius sides (5,6) of the corner table (3), a support leg (14,15) is provided, each of said two support legs (14,15) being also connected to the table top (3) and to each other by the member (8) and being connected by a further member (16) which supports the tabletop (3).

4,559,878

FOLDABLE TABLE SUITED TO OUTDOOR USE AS WELL AS TO INTERIOR USE

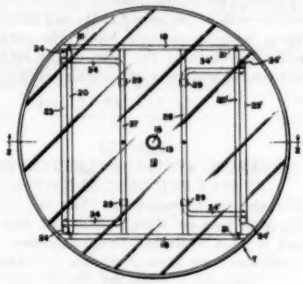
Donald B. Colby, Sarasota, Fla., assignor to Lee L. Woodard, Inc., Santa Monica, Calif.

Filed Aug. 20, 1984, Ser. No. 642,520

Int. Cl.⁴ A47B *3/00*

U.S. Cl. 108—132 **5 Claims**

1. In a folding table, suited to patio and poolside use as well as to interior use; a horizontally disposed table top having a transparent sheet top with a downwardly projecting rim; opposed foldable, nesting leg assemblies for said top, said leg assemblies being movable from a vertical position in which they support said top to a substantially horizontal position folded in nested relation against the bottom side of said top; a shaft for each leg assembly spanning said top rim and mounted for rotation with respect thereto; each leg assembly including a cross-rail generally coextensive with one of said shafts and fixed thereto, a pair of transversely spaced support legs projecting from opposite ends of each rail, and a U-shaped brace spanning said leg assembly, having a brace mid-portion with legs connecting the opposite ends thereof pivotally securing to said leg assembly at a spaced distance below said rail, a spreadable keeper member having a downwardly opening socket fixed to the underside of said top on each side of the center thereof in a location such as to releasably lockably receive the



brace mid-portion and retain the leg assemblies in vertical position; the transverse length of one brace mid-portion and the spacing between the legs of one leg assembly being less than that of the other leg assembly so as to nest therein in the folded position; the legs of each brace securing to the leg assembly inwardly of the top supporting legs and each brace mid-portion being of such transverse length as to nest within the leg assembly when the brace mid-portions are removed from said sockets and folded against said table top; and the U-shaped brace on one leg assembly nesting within the U-shaped brace on the other leg assembly when the leg assemblies are in folded position.

4,559,879

HEIGHT ADJUSTABLE WORK PLATE

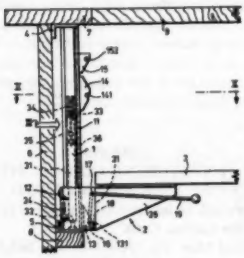
Horst Häusser, Rudersberg, Fed. Rep. of Germany, assignor to Horst Häusser Metallwaren GmbH, Rudersberg, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,352

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1981, 8138223[U]

Int. Cl.⁴ A47B *9/02*

U.S. Cl. 108—136 **13 Claims**



1. A height adjustable work support for a sewing machine table, comprising

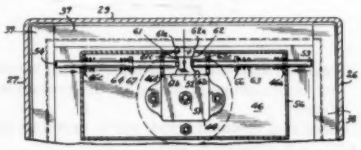
a vertical guide column which is generally C-shaped in cross section and has an open side facing rearwardly,
said column comprising corner portions having diagonally extending guiding surfaces,
a generally horizontal work plate projecting forwardly from said column,
a vertically movable carriage supporting said work plate,
said carriage having a plurality of rollers rotatably mounted thereon and in rolling engagement with said guiding surfaces of said column for guiding said carriage for vertical height adjusting movement along said column,
a variable length pneumatic spring disposed rearwardly of said column and having a lower portion connected to said column rearwardly thereof,
said pneumatic spring having an upper portion with a pulley mounted thereon,
a rope trained over said pulley and having first and second end portions extending downwardly therefrom,
said first end portion of said rope being connected to said column rearwardly thereof,
said second end portion of said rope being connected to said carriage rearwardly of said column,
and latching means operative between said carriage and said column for selectively latching said carriage in a plurality of height adjustments,
said pneumatic spring having a nearly constant force exerting characteristic throughout the range of length variation of said pneumatic spring,
whereby said carriage is counterbalanced by the force of said pneumatic spring while the range of height adjusting movement of said carriage is twice the range of length variation of said pneumatic spring.

4,559,880

SAFE

Cemal Lacka, 13 Gayle St., Middletown, N.J. 07748

Filed Sep. 30, 1982, Ser. No. 430,151
Int. Cl.[4] E05G *1/02*
U.S. Cl. 109—51 **9 Claims**



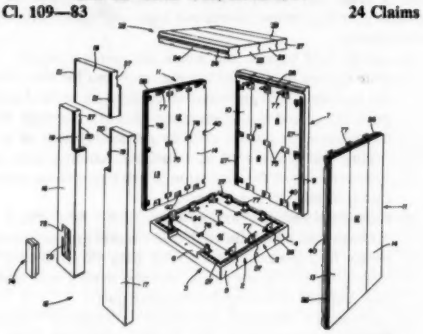
1. A safe comprising:
a steel box having two opposed and spaced apart parallel planar surfaces for defining a top surface and a bottom surface and four side surfaces substantially at right angles to the top and bottom surfaces, the box having an interior for storing valuables therein, one surface formed with an opening in at least a portion of the surface thereof for providing access to the interior;
a door mounted in the opening for opening and closing the safe and dimensioned to fit snuggly into the opening when the door is in a closed position;
lock means mounted on the door for selectively placing the door in a locked condition; and
bolt means operatively coupled to said lock means for engaging the surface formed with the opening for locking the safe, said bolt means including a main bolt adapted for displacement towards one side of the opening and two side bolts operatively coupled to said main bolt and adapted to be displaced away from said main bolt in response to displacement of said main bolt, said main bolt formed with two opposed cam side edges having a front and a rear high spot and a central low spot, the side bolts biased towards and riding on the cam edges and adapted to be displaced away from said main bolt by the high spots when said main bolt is displaced away from the lock means and when said main bolt is forced towards said lock means, and said side bolts being biased towards said low spots away from the sides of the opening when said lock means is in an open condition
whereby said side bolts engage the surface formed with the opening at two sides of the opening adjacent to the main bolt in response to said lock means being placed in a locked condition.

4,559,881

BURGLARY RESISTANT STEEL FIBER REINFORCED CONCRETE CONSTRUCTION FOR VAULT WALLS AND DOORS AND MANUFACTURE THEREOF

David R. Lankard, Columbus, and James D. Shoop, Canton, both of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Aug. 19, 1983, Ser. No. 524,584
Int. Cl.[4] C04B *7/02;* **E04B** *2/84*
U.S. Cl. 109—83 **24 Claims**



1. A burglar resistant castable concrete panel construction for assembly into an integrated secure vault, wherein the improvement comprises:
a concrete composition which can be fully consolidated when cast with water to cement ratios less than 0.30 and steel fiber content of 7.21% to 7.73% by weight, consisting essentially of:

Constituents	Weight %
Portland Cement wherein said cement is selected from the group consisting of Type I and Type III Portland Cement;	18.88 to 19.81
Fly Ash wherein said fly ash is selected from the group consisting of Glass F and Class C fly ash;	1.37 to 1.45
Fine Aggregate (SSD);	39.12 to 40.86
Gravel wherein said gravel is selected from the group consisting of No. 8 gravel and crushed stone, (SSD);	25.12 to 26.53
Water;	4.81 to 5.15
Melamine Superplasicizing Water-Reducing Admixture; and,	0.96 to 1.04
Steel fibers;	7.21 to 7.73.

4,559,882

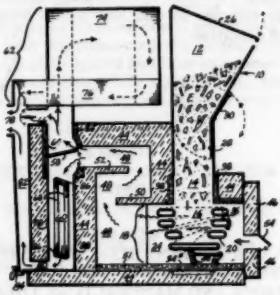
BIOMASS-FUELED FURNACE

Lawrence A. Dobson, 1385 33rd Ave. S., Seattle, Wash. 98144

Filed Jun. 4, 1984, Ser. No. 616,902

Int. Cl.[4] F23G *3/00*

U.S. Cl. 110—254 **4 Claims**



1. A biomass-fueled furnace for burning dry, green, or wet biomass fuels, such as logs, wood and brush chips, sawdust, nut shells, peat, and biomass waste products of agriculture and industry, at high temperatures and high combustion efficiency, comprising:

a gravity feed hopper into which the fuel is charged;

a grate system below said hopper upon and between which the fuel rests, said grate system comprising several hollow grate rungs and interconnecting channels through which combustion air travels, thereby preheating said air to aid drying and igniting of said fuel and cooling said grate system to retard the formation of ash slag and the deterioration of said grate system;

a fully insulated ignition/pyrolysis zone into which the preheated air enters through holes in said grate system and passes in a generally horizontal path through said fuel resting on said grate rungs, thereby drying and igniting said fuel and liberating combustible gases;

a ceramically insulated secondary combustion chamber, laterally connected to the ignition/pyrolysis zone and capable of withstanding operating temperatures of at least 1500° F., the secondary combustion chamber insulation enabling secondary combustion of the evolved gases at temperatures above 1200° F., said secondary combustion chamber being partitioned by at least two substantially horizontally disposed baffles which effectively mix the preheated air with said combustible gases while allowing them to alternately travel horizontally and upwardly as they mix and burn; and

a secondary combustion chamber air inlet including damper means for controlled delivery of additional preheated combustion air directly into the secondary combustion chamber without passing through the fuel charge.

4,559,883

SEWING MACHINE FOR FORMING A PLURALITY OF SEAMS

Cornelis P. Lemke, Apeldoorn, Netherlands, assignor to Rockwell-Rimoldi S.p.A., Italy

Continuation-in-part of Ser. No. 398,496, Jul. 15, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 623,699

Claims priority, application Netherlands, Jul. 22, 1981, 8103466

Int. Cl.[4] D05B *25/00, 35/02*

U.S. Cl. 112—136 **6 Claims**

1. In a sewing machine of the type having a supporting frame and a planar work surface for advancing a workpiece to the sewing zone, a device for simultaneously forming a plurality of spaced and parallel seams of chain stitches comprising:

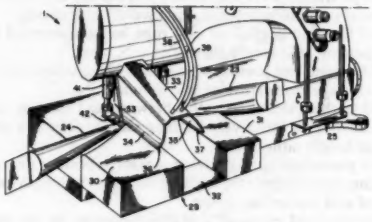
(a) a pair of spaced needle bars mounted in the supporting frame including:

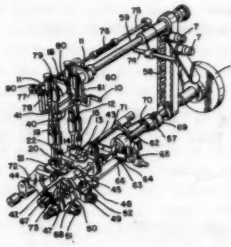
(i) a needle clamp for supporting at least one needle fixed to the lower end of each needle bar;

(ii) means interconnecting said needle bars for effecting simultaneous actuation thereof;

(b) a presserfoot bar mounted for reciprocating movement adjacent each said needle bar including:

(i) a presserfoot mounted on the lower end thereof in operative association with the needles carried by said needle clamps;





(ii) means interconnecting said presserfoot bars for effecting simultaneous actuation of the presserfeet carried thereby;

(c) a feed dog mounted below and in operative association with each presserfoot; and

(d) a looper pivotally mounted below each feed dog including:

(i) means interconnecting one looper with the other for effecting simultaneous movement thereof to and from operative association with the needles carried by said needle clamps.

4,559,884

HOLLOW THREAD BUNDLE AND METHOD OF ITS MANUFACTURE

August Stöldt, Volkmarsen; Heinz Stemig, Erkrath; Hans-Günther Breidohr, and Manfred Martin, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Nov. 8, 1982, Ser. No. 440,023

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144813

Int. Cl.[4] D05B *97/00, 93/00;* D02G *3/00*

U.S. Cl. 112—262.1 **16 Claims**

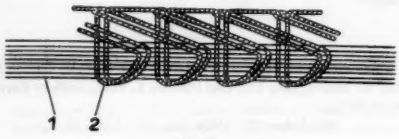
1. A hollow thread bundle element for material and/or heat exchange, comprising

a plurality of substantially parallel hollow threads having a substantially equal length and together forming a three-dimensional hollow thread bundle; and

a sewing seam including at least one sewing thread and

loosely wrapping said hollow threads around without passing through the hollow thread bundle or deforming the latter so as to prevent damaging to or cross-section reduction of the hollow threads which can otherwise result in rejection or output decrease of the bundle element.

10. A method of producing a hollow thread bundle element; comprising the steps of



providing a plurality of substantially parallel hollow threads having a substantially equal length and together forming a three-dimensional hollow thread bundle; and

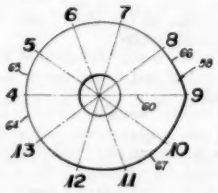
loosely wrapping around the plurality of hollow threads by a sewing seam including at least one sewing thread and without passing through the hollow thread bundle or deforming the later so as to prevent damaging to or cross-section reduction of the hollow threads which can othersiwe result in rejection or output decrease of the bundle element.

4,559,885

APPARATUS AND PROCESS FOR PRODUCING A CHAIN STITCHED TUFTED PRODUCT

Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

Filed Oct. 22, 1984, Ser. No. 663,183
Int. Cl.⁴ D05C *15/00*
U.S. Cl. 112—266.2 **10 Claims**



1. A method for producing a chain stitched tufted product in which a backing material is moved along a prescribed first path, disposing a needle with yarn therein on one side of said first path and disposing a looper on the opposite side of said first path, reciprocating said needle in a path of reciprocation for inserting successive increments of said yarn through said backing material to form successive loops as the needle is successively inserted to a prescribed depth of penetration into said backing material, the improvement comprising the steps of:

(a) reciprocating the looper in synchronization with the reciprocation of the needle for moving the bill of the looper past the needle in the first direction of movement opposite the direction of movement of the backing material for inserting said bill through each loop of yarn as the needle approaches its fully inserted position into the backing material and so that the bight of each loop is retained on said bill as the needle is withdrawn from the backing material;

(b) holding the loop of yarn by the bill while the needle is retracted from the backing material and as the root of the loop is moved by the backing material away from the path of reciprocation of the needle;

(c) continuing the movement of said bill in said first direction sufficiently that the engaged bight of the loop is moved beyond the path of travel of said needle and so that such engaged loop is disposed angularly with respect to said path of travel of said needle;

(d) continuing the holding of said bight by said looper as the needle again penetrates the backing material so that a subsequent loop, formed by a subsequent increment of yarn, is inserted by the needle through the held loop; and

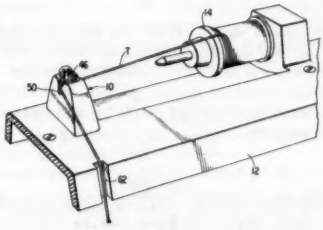
(e) moving the looper in an opposite direction sufficiently to release the held loop after the needle has inserted the subsequent loop through the held loop.

4,559,886

THREAD GUIDE CONSTRUCTION

Thaddeus J. Zylbert, Morris Plains, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 9, 1984, Ser. No. 669,715
Int. Cl.⁴ B65H *57/00, 59/12*
U.S. Cl. 112—302 **7 Claims**



1. A guide for sewing thread extending from a supply spool on a sewing machine, the guide comprising a core portion of a resilient plastic material having an outer portion of generally cylindrical configuration for at least a substantial portion of the length thereof and a rigid core embracing portion which is more resistant to thread wear than the core portion, said core embracing portion being formed with a cylindrical hole wherein the cylindrical portion of the core portion is received, said core portion including a thread entrapping passageway with an upper diverging thread receiving notch, and said core embracing portion including thread guiding grooves communicating with the thread entrapping passageway in the core portion.

4,559,887

SWITCHING MECHANISM OF CONTROL AMOUNT IN ELECTRONIC CONTROL SEWING MACHINE

Yasuro Sano, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,513
Claims priority, application Japan, Jan. 20, 1983, 58-5487
Int. Cl.⁴ D05B *3/02*
U.S. Cl. 112—455 **4 Claims**

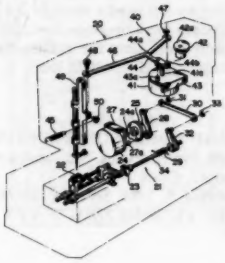
1. An electronic control sewing machine having a fabric feeding mechanism for feeding a fabric in forward and rearward directions and a needle bar with a needle reciprocated vertically and being swingable laterally of the fabric feeding directions to produce stitching patterns in accordance with pattern signals stored in a memory as the programs for controlling the amount of a needle bar amplitude and the fabric feeding amount of the feeding mechanism, the sewing machine comprising;

(a) a control motor having an output shaft driven in response to the pattern signals per rotation of the sewing machine to produce rotational outputs for controlling at least one

of said amount of said needle bar amplitude and said fabric feeding amount of said feeding mechanism;

(b) a cam body positioned on said output shaft of said control motor and secured to said shaft and including a plurality of cam faces of different contours shaped so as to modify said rotational outputs of said control motor;

(c) a cam follower engaging said cam faces of said cam body; and



(d) transmission means having one end connected to said cam follower and the other end connected to one of said needle bar and said fabric feeding mechanism, whereby modified rotational outputs of said control motor are transmitted to one of said needle bar and said fabric feeding mechanism.

4,559,888

SHIP FOR TRANSPORTING COAL SLURRY

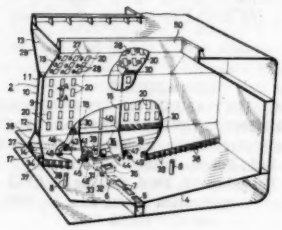
Yasunobu Shudo; Masayoshi Kano; Tatsuya Murahashi; Yasuo Nakai, and Kazuyoshi Hosogaya, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jun. 14, 1982, Ser. No. 388,233

Claims priority, application Japan, Jun. 16, 1981, 56-93451; Jun. 16, 1981, 56-89136[U]; Dec. 8, 1981, 56-183013[U]; Dec. 9, 1981, 56-183925[U]; Dec. 23, 1981, 56-196331[U]; Mar. 31, 1982, 57-47646[U]; Mar. 31, 1982, 57-47644[U]; Mar. 31, 1982, 57-47645[U]

Int. Cl.⁴ B63B *25/08*

U.S. Cl. 114—74 R **1 Claim**



1. A ship for transporting a coal slurry comprising:

a plurality of holds with adjacent holds being partitioned by a pair of transverse bulkheads;

a plurality of sections formed in the interior space between the two bulkheads of each of said pair by longitudinal partitions;

including a pump room section,

a front drain sump section and a rear drain sump section disposed in said interior space and independent from each other;

filter-equipped drain outlets formed substantially over the entire height of the front wall of the front drain sump and of the rear wall of the rear drain sump;

a slurry container provided under the bottom wall of the hold for collecting a slurry from the bottom of the hold during loading; and

a pump means provided in said pump room in between said transverse bulkheads for discharging the slurry water from the drain sumps within said transverse bulkheads and also for discharging the coal slurry from the slurry container.

4,559,889

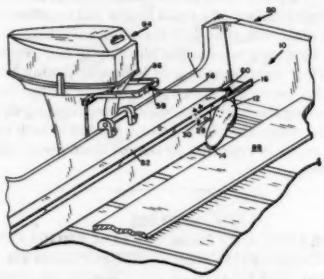
OUTBOARD MOTOR STEERING CONTROL SYSTEM

Harlan W. Olson, Box 132, and Patrick L. Hall, both of Barrett, Minn. 56311

Filed Jun. 26, 1984, Ser. No. 624,776

Int. Cl.⁴ B63H *25/00*

U.S. Cl. 114—153 **1 Claim**



1. Motor control steeing system for an outboard motor of a boat comprising:

a. two-bar linkage means including a shorter rigid bar and a longer rigid bar;

b. foot pedal means shaped as a foot and including a heel plate connected to one end of said shorter bar of said two-bar linkage means;

c. outboard motor means connected by a ball joint means to an other end of said longer bar of said two-bar linkage means; and,

d. U-shaped bracket means including an axially mounted rod in legs of said bracket means, said rod connected to said foot pedal means and said bracket means including a plurality of holes for receiving bolts, whereby said bracket means bolts to a rear seat of a boat and actuation of said foot pedal means causes rotation within said U-shaped bracket means and transfers motion through said two-bar linkage means to said outboard motor means causing subsequent rotation of said outboard motor means mounted on an end of a boat means and about a vertical axis of said outboard motor means by movement of an individual's foot.

4,559,890

MOORING RELEASE APPARATUS AND METHOD

John A. Regalbuto, and Glenn B. Christopher, both of Forth Worth, Tex., assignors to Jet Research Center, Inc., Arlington, Tex.

Filed Apr. 25, 1983, Ser. No. 487,936

Int. Cl.⁴ B63B *21/24*

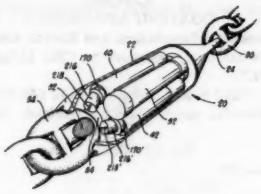
U.S. Cl. 114—230 **15 Claims**

5. A method of releasing a submerged mooring, comprising:

providing a plurality of pyrotechnic torches having nozzles;

orienting said torch nozzles proximate a first mooring element at locations at each end of a portion of said first mooring element across which a second mooring element extends;

substantially simultaneously igniting said pyrotechnic torches, thereby initiating high temperature non-explosive jets from said nozzles against said first mooring element



and severing said first mooring element at each end of said portion across which said second mooring element extends.

4,559,891

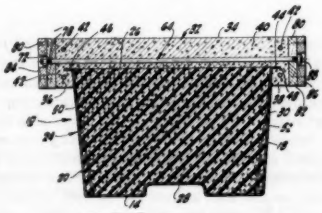
PONTOON

Myron L. Shorter, Jr., 834 Vellejo Ave., Novato, Calif. 94547

Continuation of Ser. No. 401,864, Jul. 26, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 629,064

Int. Cl.⁴ B63B *35/38*

U.S. Cl. 114—263 **6 Claims**



1. A pontoon for use in floating docks comprising:

a. a preformed container comprising a bottom portion, and side portions extending upwardly therefrom forming a top portion;

b. a moldable cap covering said top portion of said container; said moldable cap having an upper surface useable as a platform; and

c. means for holding said moldable cap to said preformed container, including a flange extending from a part of said side portions of said container, said flange being moldably embedded within said moldable cap, said preformed container and moldable cap held thereto being floatable in water with said moldable cap above said preformed container.

4,559,892

AMPHIBIOUS VEHICLE

Raul S. Cascallana, C/ Bergantin, 31 - Vista Hermosa - Puerto de Santa Maria (Cadiz), Spain

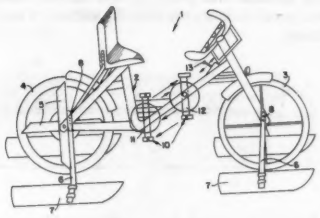
Filed Oct. 4, 1983, Ser. No. 538,974

Claims priority, application Spain, Oct. 15, 1982, 267.864; Jul. 7, 1983, 273.356

Int. Cl.⁴ B60F *3/00*

U.S. Cl. 114—270 **8 Claims**

1. Amphibious vehicle with a bicycle or motorcycle frame, front and rear wheels, the rear wheel comprising a hub, a rim, and resistant elements extending between the hub and the rim and formed as blades at one end, a pedal assembly having a pedal shaft coupled to the hub of the rear wheel which propels the vehicle when the pedals are operated; a chassis for each of the wheels having at least one lateral resistant arm having at its end a float to keep the vehicle afloat, each of the said arms being articulated to permit it to be folded sideways towards the wheel when the vehicle is used as a land vehicle; and adjustable means mounting the pedal assembly on the chassis frame with the rotary axis of the pedal shaft in one of a lower and an upper position depending on whether the vehicle is to run on land or on water, respectively, said adjustable mounting means including a bush rotatably mounting the pedal shaft, and a part of



"U" shaped cross section, said frame having an enlargement engaging said U-shaped part and extending between two end stops on the frame; and a bolt to fix the position of the pedal-shaft-mounting bush on said frame enlargement, the pedal assembly having tensor to adjust the tension on said chain to ensure proper coupling of pedal shaft to the rear hub.

4,559,893

SHANK FOR AN ANCHOR STRUCTURE

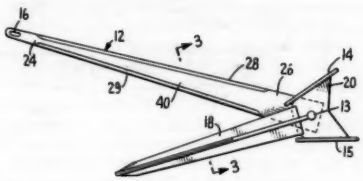
Robert D. Ogg, Kentfield, Calif., assignor to Alpha Ocean Systems, Inc., Kentfield, Calif.

Continuation-in-part of Ser. No. 387,461, Jun. 11, 1982, Pat. No. 4,469,042, which is a continuation-in-part of Ser. No. 175,766, Aug. 6, 1980, abandoned. This application Aug. 20, 1984, Ser. No. 642,338

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ B63B *21/44*

U.S. Cl. 114—304 **4 Claims**



3. In an anchor, a thin, flexible and resilient shank having a tip end and a base end for attachment in an anchor, the shank when at rest having a horizontal plane and a vertical plane normal to the horizontal plane, the shank being inherently rigid in said vertical plane and capable of flexing in a horizontal plane throughout its length with a tip angle of at least 25° without causing permanent deformation of the shank.

4,559,894

FIBER-CEMENT DECK STRUCTURE

Thomas L. Thompson, Irvine, Calif., assignor to Thom McI, Inc., Balboa, Calif.

Continuation-in-part of Ser. No. 444,802, Jul. 29, 1982, Pat. No. 4,517,239. This application Feb. 15, 1985, Ser. No. 702,405

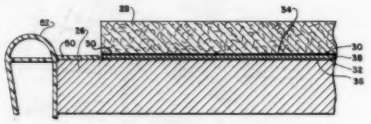
Int. Cl.⁴ B32B *3/26;* **B63C** *1/02*

U.S. Cl. 114—45 **3 Claims**

1. A floating dock structure having a fiber-cement deck structure comprising:

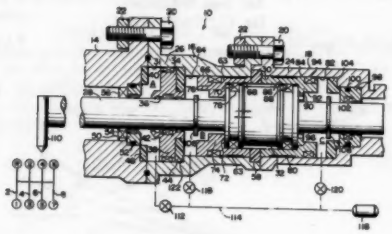
a floating deck assembly; and

a fiber-cement dock structure comprising:
a first panel member formed from a sheet of plywood having a predetermined size and configuration, said first panel defining a substructure;
a second panel member consisting essentially of cement, crushed limestone, volcanic ash and fibrous material, and having a predetermined size and configuration so as to be affixed to said first panel on one surface thereof, said second panel defining the walking surface of said flooring structure;



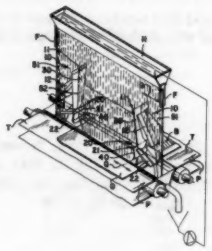
means for securing said first panel to said second panel, whereby said flooring structure is formed;
said securing means comprising:
a first bonding layer of catalyzed resin material coated on the top surface of said sheet of plywood;
a second bonding layer of catalyzed resin material coated on the underside of said sheet of fiber cement; and
a third intermediate layer of a catalyzed resin material interposed between said first and second bonding layers.

4,559,895
POSITIONING DEVICE
Nobuo Kijima, Inagi, and Yukio Hasegawa, Kawasaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 19, 1983, Ser. No. 533,544
Int. Cl.[4] G01D *13/22*; F01B *7/10*
U.S. Cl. 116—200 **12 Claims**



1. A positioning device comprising:
a cylinder having a large-diameter portion and a small-diameter portion both formed on the same central axis;
a rod extending through said cylinder;
a first piston fixed to said rod;
a second piston having an outer peripheral surface which engages the inner peripheral surface of said large-diameter portion of said cylinder;
third and fourth pistons which are fitted in said small-diameter portion of said cylinder so as to be fitted over said first piston;
a chamber A formed by said second piston and an end portion of said cylinder;
a chamber B formed by said second and first pistons; and
a chamber C formed by said first piston and the other end portion of said cylinder,
said first piston being slidable together with said third piston within said chamber B and slidable together with said fourth piston within said chamber C, said second piston being slidable only within said chamber A, said third piston being slidable within said chamber B and slidable together with said second piston, with fluid being fed to said chamber A, B or C to selectively position said first piston and thereby selectively position said rod.

4,559,896
COATING APPARATUS
Alfred E. Bossard, Mutschellen, and Kaspar Kuster, Allschwil, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.
Filed Sep. 7, 1984, Ser. No. 648,198
Claims priority, application Switzerland, Sep. 15, 1983, 5031/83
Int. Cl.[4] B05B *1/04*
U.S. Cl. 118—300 **19 Claims**



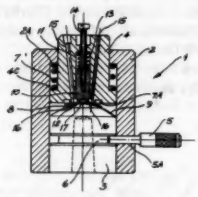
1. A coating apparatus comprising a conveyer belt for conveying objects to be coated, a pouring head device above said conveyer belt and extending transverse to the direction of movement of the latter, said pouring head device comprising a pouring head adapted for pouring coating material in the form of a curtain freely falling on to the objects being conveyed on said belt, lateral curtain guiding means on both sides of said curtain comprising an outwardly inclined section which serves to spread said curtain, and, at least on one side of said curtain directly below said lateral curtain guiding means, a rim-zone severing device for severing a thickened rim zone of said curtain from a central region of the latter, thereby limiting the width of said curtain, said rim-zone severing device being disposed a short distance above the level of impingement of the curtain on the objects to be coated, and being adapted to remove coating material waste from a cut-off rim zone of said curtain, and an edge-guiding member for guiding the resulting narrow-width curtain, said edge-guiding member extending from a point of cutting engagement of said severing device with said curtain downward to closely above said level of impingement of the resulting narrowed curtain on said objects to be coated.

4,559,897
HYDROPHILIC LENS TINTING AND COLORING APPARATUS
Peter D. Urrea, 1636 Fuerte Knolls La., El Cajon, Calif. 92020; Geoffrey W. Doris, 4 Silvermere Ave., Paradise, Australia 5075, and Stephen D. Newman, 7 Argyle St., Prospect, Australia 5082
Continuation of Ser. No. 548,605, Nov. 4, 1983, abandoned. This application Mar. 29, 1985, Ser. No. 718,183
Claims priority, application Australia, Nov. 11, 1982, 91422/82
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—406 **8 Claims**

1. An apparatus for the colouring or tinting of one or more selected areas of a soft or flexible contact lens to precise measurements, the apparatus comprising:
a support means formed to closely match one of the surfaces of the lens;
a mask means adapted to operatively associate with the support means to delineate said one or more selected areas

by providing one or more peripheral zones of compression within the lens to prevent the migration of an applied colouring or tinting medium thereacross;

biasing means for maintaining said mask means at a predetermined rate of compression against the lens; and



at least one passage means extending through the mask means communicating to at least one area adjacent a zone of compression for introducing a colouring or tinting dye to the area of the lens adjacent the zone of compression.

4,559,898

DEVELOPING UNIT

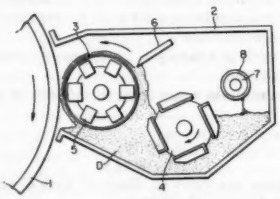
Masakazu Fukuchi; Keiji Oishi, and Yasuyuki Iwai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,614

Claims priority, application Japan, Oct. 26, 1981, 56-160083[U]

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 118—653 **9 Claims**



1. In a device for mixing developer for an electrostatic latent image recorder comprising a shaft adapted to rotate in a first direction around its axis, a body fixed around said shaft to rotate therewith and at least one mixing blade fixed on said body, the improvement wherein said body has faces defining a polygonal cross section, said mixing blade comprises at least one primary mixing member which is capable of moving said developer in said first direction, a secondary mixing member capable of moving said developer in a second direction which is parallel to said axis, and a tertiary mixing member adapted to displace said developer in a third direction which is parallel to said axis and opposite said second direction, said secondary and said tertiary members being angularly disposed to said primary member at an angle other than 90°, and said secondary mixing member and said tertiary mixing member being arranged alternately on said body in the rotating direction of said body.

4,559,899

THIN DEVELOPER LAYER FORMING DEVICE

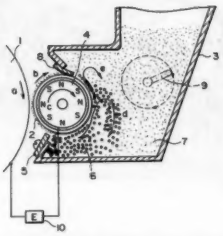
Fumitaka Kan, Yokohama; Hidemi Egami, Zama; Atsushi Hosoi, Tokyo; Hatsuo Tajima, Matsudo; Shunji Nakamura, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,411

Claims priority, application Japan, Jul. 19, 1983, 58-130340

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 118—657 **8 Claims**



1. A thin developer layer forming device, comprising:

a developer supply container, having an opening, for containing a non-magnetic developer and magnetic particles;

an endlessly movable developer carrying member for carrying the developer and movable between the inside of said developer supply container and the outside of said developer supply container through the opening;

means for moving said developer carrying member in a direction to convey the non-magnetic developer to a developing area;

magnetic field generating means, disposed in said carrying member, for generating a magnetic field, wherein the magnetic particles are carried on the surface of said carrying member by said magnetic field, and are circulatable in said developer supply container;

a magnetic particle confining member provided at a position where the developer discharges out of said container, said confining member being effective to regulate the amount of developer discharged as a thin layer from said container and being cooperable with a magnetic pole of said magnetic field generating means to prevent the magnetic particles from leaking from said container;

sealing means provided at a position where the developer on said carrying member returns, after developing action at the developing area, into said container, said sealing means being effective to allow the developer to return into said container while preventing the magnetic particles from leaking out thereof; and

means for rotating said magnetic field generating means in the same direction as said developer carrying member so as to move the magnetic particles in a direction opposite to the movement direction of said developer carrying member;

whereby substantially only non-magnetic developer is withdrawn from said container for development.

4,559,900

DEVICE FOR COATING STRIP MATERIAL

David M. Knapke, Northbrook, and Kenneth C. Johnson, Des Plaines, both of Ill., assignors to F. J. Littell Machine Co., Chicago, Ill.

Filed Mar. 1, 1984, Ser. No. 585,187

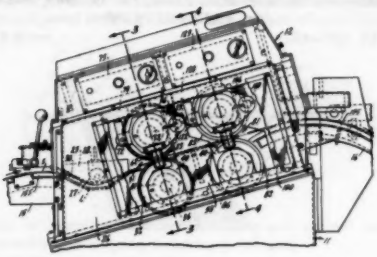
Int. Cl.⁴ B05C *3/12*

U.S. Cl. 118—672 **7 Claims**

1. A device for applying lubricant to both surfaces of a strip of metal, comprising:

(a) a reservoir containing liquid lubricant;

(b) coating roll means for pulling the strip through said lubricant and squeegeeing off excess lubricant;
(c) metering roll means adjacent and downstream of said coating roll means;
(d) said metering roll means having a plated metal surface which has been uniformly roughened by grit blasting or the like;



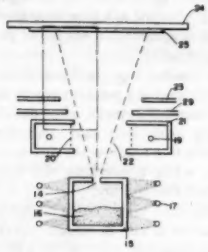
(e) said metering roll means including a pair of rolls, the surfaces of which are spaced apart a distance corresponding to the thickness of the strip and constructed to form a plurality of spaced pools of lubricant on the surfaces of the strip; and
(f) sensing means for sensing the altitude of the lubricant coated strip at a prescribed point after it leaves the metering rolls and controlling the device based on that altitude.

4,559,901

ION BEAM DEPOSITION APPARATUS

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaoka-kyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jan. 30, 1985, Ser. No. 696,518
Claims priority, application Japan, Jan. 31, 1984, 59-15731; Mar. 26, 1984, 59-59000
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—723 **8 Claims**



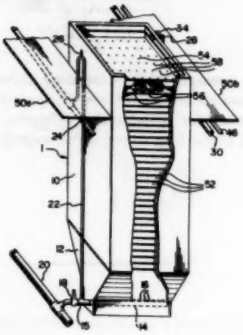
1. An ion beam deposition apparatus comprising:
an ionization region for ionizing at least a part of a vaporized material and imparting kinetic energy to said ionized vaporized material to transport said ionized vaporized material together with non-ionized vaporized material to a substrate, to thereby deposit said vaporized material on said substrate;
an accelerating electrode arranged between said ionization region and said substrate for imparting necessary kinetic energy to said ionized vaporized material when said ionized vaporized material reaches said substrate; and
means for providing said ionized vaporized material of a uniform concentration over a desired area of said substrate or uniformly distributing said ionized vaporized material over said area, said means being arranged between said ionization region and said substrate.

4,559,902

APPARATUS AND METHOD FOR HOLDING AND CULTIVATING AQUATIC CRUSTACEANS

Edgar G. Mason, Crapaud; Harold Clark, Victoria, and James A. Forsythe, Halifax, all of Canada, assignors to Hugh Paton, Prince Edward Island, Canada

Filed May 24, 1984, Ser. No. 613,636
Claims priority, application Canada, Nov. 28, 1983, 442082
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—2 **24 Claims**



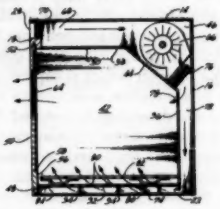
1. Apparatus for holding and cultivating shellfish and the like comprising:
a well having an open top and a closed bottom for holding water;
a plurality of buoyant trays each subdivided into a plurality of compartments sized to house a shellfish and having a perforated bottom, said trays being adapted for submersion within the well to form a column of trays;
means to maintain said column of trays in a submerged condition;
means to draw water from the vicinity of the bottom of said well and to lift and aerate the same for recirculation to the top of the well;
means to introduce a supply of fresh treated water to the top of the well; and
drain means to drain water from the bottom of said well.

4,559,903

PET DRYER

Phyllis R. Bloom, and Perry O. Sherrard, both of 8222 Delongpre #1, Los Angeles, Calif. 90046

Filed Aug. 13, 1984, Ser. No. 639,734
Int. Cl.[4] A01K *1/02, 13/00*
U.S. Cl. 119—19 **9 Claims**



1. A pet dryer comprising:

a housing including a closed chamber to hold a pet, the housing including a door operable to open the chamber for locating a pet therein and for closing the chamber, a vent disposed in the door, the chamber including a floor and a rear wall opposite the door, the rear wall including at least one aperture disposed above the floor and the floor including at least one other aperture; and

means for supplying heated air to the chamber from each rear wall aperture for drying particularly the torso and head of the pet and from each floor aperture for drying the feet, legs, torso underside and head, the heated air circulating through the chamber and exhausting therefrom through the vent.

4,559,904

FEEDING BOX

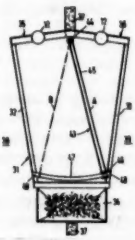
Jan H. Harmsen, BJ Hengelo, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed May 18, 1983, Ser. No. 495,866

Claims priority, application Netherlands, May 18, 1982, 8202053; May 19, 1982, 8202086

Int. Cl.⁴ A01K *5/02*

U.S. Cl. 119—51 R **5 Claims**



1. A feeding box for animals, said feeding box comprising:

a plurality of upright walls,

an access opening for a fodder dispenser, said access opening being located in one of said plurality of upright walls,

a gate assembly defining an enclosed space with said plurality of upright walls, said gate assembly including two sets of gate means, each of said two sets of gate means being pivotably mounted on one of said plurality of upright walls to allow entrance and exit of an animal to and from said enclosed space,

a partition gate located in said enclosed space, one end of said partition gate being pivotably mounted about a vertical pivot member mounted adjacent to and centrally between said two sets of gate means and an end of said partition gate, opposed to said one end being swung through an arc of rotation passing in front of said access opening, said partition gate being pivoted about said one end to move said opposed end of said partition gate between two positions spaced along said arc of rotation,

a first switch being located at one of said two positions and a second switch being located at the other of said two positions, one of said first switch and said second switch being actuated by said partition gate when said opposed end is swung through said arc of rotation,

latch means for locking each of said two sets of gate means, and

control means for actuating said fodder dispenser, said control means including switch means for actuating said control means when one of said first switch and said second switch are actuated by said partition gate, and actuating means for an animal to actuate said switch means when an animal is proxmite to said switch means, said control means controlling said latch means to lock one of said two sets of gate means so that an animal in said enclosed space may eat without being disturbed.

4,559,905

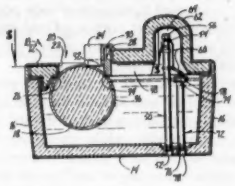
LIVESTOCK WATERING TANK

Claude W. Ahrens, Grinnell, Iowa, assignor to Ahrens Agricultural Industries Co., Grinnell, Iowa

Filed Sep. 20, 1984, Ser. No. 652,212

Int. Cl.⁴ A01K *7/00*

U.S. Cl. 119—73 **11 Claims**



1. A livestock watering tank, comprising:

an insulated tank for receiving water from a water source and having a top, a bottom and a sidewall, each of said top, bottom and sidewall having an interior surface and an exterior surface;

an opening extending through said top disposed for access by the head of an animal;

a buoyant spherical float for normally closing said opening and being rollable away from said opening in response to force applied to said float by the head of an animal seeking a drink whereby water is presented to the animal for drinking;

a water inlet means connected to said water source and extending into said tank for supplying additional water to said tank when the water level therein recedes to a predetermined level,

track means in said tank upon which said float rolls and which urges said float into closing relationship with said opening; and

said track means including a pair of spaced apart elongated flanges attached to said interior surface of said top of said tank, each of said flanges having a first end adjacent said opening and a second end remote from said opening, said second ends of said flanges converging towards one another whereby said float engages and is submerged further into the water by said flanges when rolled away from said opening.

4,559,906

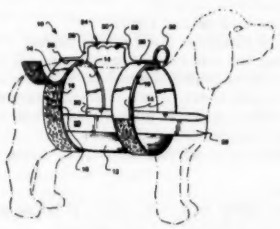
SMALL ANIMAL HARNESS

Maurice D. Smith, Dallas, Tex., assignor to Dennis W. Whiting, Irving, Tex., a part interest

Filed Apr. 23, 1984, Ser. No. 602,687

Int. Cl.⁴ A01K *29/00*

U.S. Cl. 119—96 **10 Claims**



1. A harness for transporting a small animal, and for support-

ing the trunk of said animal while it is being transported, said harness comprising:

a flexible main body portion adapted to wrap around the underside of the trunk of said small animal;

first and second back straps attached to said main body portion and adapted to wrap around the trunk and over the back of said small animal at forward and rear support positions, respectively;

attachment means mounted onto said first and second back straps for securing said straps about the trunk of said small animal at the forward and rear support positions, respectively;

a chest strap connected to said main body portion for passing adjacent the upper chest portion of said small animal to aid in retaining said harness in functional position about said small animal; and,

a handle having first and second end portions movably coupled to the first and second back straps, respectively, for maintaining said straps in the forward and rear support positions, respectively, while simultaneously permitting said first and second back straps to move relative to said handle to allow centering of said handle about the harness and about the center of the animal's back when the animal and harness are lifted by said handle.

4,559,907

LOAD RESPONSIVE TEMPERATURE CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

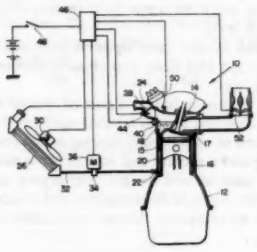
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 26, 1984, Ser. No. 593,252

Claims priority, application Japan, Mar. 31, 1983, 58-53787; Aug. 8, 1983, 58-144711

Int. Cl.⁴ F01P *3/22*

U.S. Cl. 123—41.12 **11 Claims**



6. A method of operating an internal combustion engine comprising the steps of:

introducing coolant into a coolant jacket of the engine in a liquid form;

discharging said coolant from said coolant jacket in a gaseous form;

condensing the gaseous coolant discharged from said coolant jacket in a radiator;

sensing the load on said engine;

sensing the rotational speed of said engine;

controlling the rate of condensation in said radiator in response to the sensed engine load and sensed engine rotational speed, so as to control the temperature prevailing in said coolant jacket to a level appropriate for the sensed load and engine rotational speed.

10. In an internal combustion engine having a combustion chamber,

a radiator;

a coolant jacket in which coolant is boiled and the vapor produced condensed in said radiator;

a level sensor disposed in said coolant jacket;

means responsive to said level sensor for maintaining the level of liquid coolant in said coolant jacket above said combustion chamber;

a temperature sensor for sensing the temperature of coolant in said coolant jacket; and

a device for varying the rate of condensation of said vapor in said radiator in accordance with the output of said temperature sensor.

4,559,908

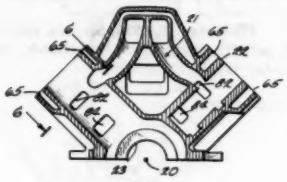
ENGINE BLOCK WITH UNITARILY CAST EXHAUST GAS PASSAGES AND WATER JACKET CAVITY

John D. Flaig, Libertyville, Ill., and Dale L. Taipale, Dalafield, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 15, 1983, Ser. No. 504,537

Int. Cl.⁴ F01P *3/12*

U.S. Cl. 123—41.28 **9 Claims**



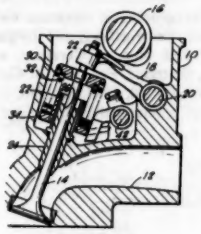
1. A method of fabricating an integrally cast engine block including a plurality of cylinders, exhaust gas passages respectively including passage portions which respectively extend from and communicate with the cylinders, and wall portions in spaced opposed relation to the cylinders and the exhaust gas passages and defining a water jacket cavity including respective water jacket cavity portions encircling the exhaust gas passage portions in the area immediately adjacent to the communication of the exhaust gas passage portions with the cylinders, said method comprising the steps of providing a mold cavity which defines the cylinders, the exhaust gas passages including the exhaust gas passage portions, and the wall portions which define the water jacket cavity including the water jacket portions encircling the exhaust gas portions in the area immediately adjacent to the communication of the exhaust gas passage portion with the cylinders, filling the mold cavity with molten metal to provide a unitarily cast engine block, and permitting solidification of the block to thereby provide the exhaust passage portions and the water jacket cavity including the portions encircling each of the exhaust gas passage portions in the area immediately adjacent to the communication of the exhaust gas passage portions with the cylinders.

9. An integrally cast engine block including an exterior surface, said block also including integrally cast first wall means defining a plurality of cylinders in parallel relation to each other, said block also including second wall means integrally cast with said first wall means and defining a plurality of exhaust gas passages communicating with said exterior surface and respectively including portions respectively extending from and communicating with said plurality of cylinders, and said block also including third wall means integrally cast with said first and second wall means and including wall portions in spaced opposed relation to said first and second wall means to define a coolant jacket cavity extending within said block and located inwardly of said exterior surface and having inlet and outlet openings in said exterior surface, said water jacket cavity encircling said cylinders and said exhaust gas passages and including a plurality of coolant jacket portions respectively encircling said plurality of exhaust gas passage portions in the area immediately adjacent to the communication of said exhaust gas passage portions with said cylinders.

4,559,909
VALVE MECHANISM FOR AN INTERNAL COMBUSTION ENGINE

Shoich Honda; Osamu Muto, and Masaru Shirakura, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 638,050
Claims priority, application Japan, Aug. 4, 1983, 58-142983
Int. Cl.[4] F01L *31/22*
U.S. Cl. 123—90.28 9 Claims

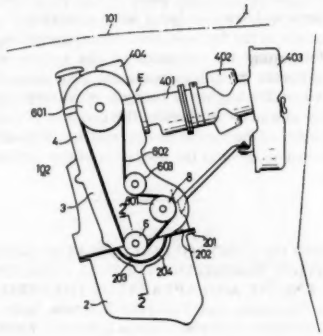


1. A valve mechanism for an engine, comprising
a poppet valve;
a valve spring retainer adjustably positioned on the engine at said poppet valve;
a valve spring effectively compressed between said poppet valve and said valve spring retainer; and
means for adjusting the position of said valve spring retainer responsive to preselected engine conditions, said adjusting means including a stepping mechanism providing stepwise adjustment of said second valve spring retainer.

4,559,910
CRANKSHAFT BEARING DEVICE FOR INTERNAL COMBUSTION ENGINE

Tadashi Tsuchiyama, and Yoshiaki Hidaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,694
Claims priority, application Japan, Nov. 24, 1982, 57-206659
Int. Cl.[4] F02F *7/00*
U.S. Cl. 123—195 R 3 Claims

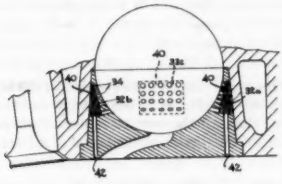


1. In an internal combustion engine having a crankshaft, and having a camshaft pulley driven from a crankshaft pulley by means of a timing belt having one side extending directly to the camshaft pulley and other side extending obliquely at a substantial angle to the one side, the improvement comprising, in combination: a cylinder block having a split bearing for supporting the crankshaft near one end thereof, said split bearing including a semicircular bearing holder secured to said cylinder block, said bearing holder having a flange projecting axially of the crankshaft toward said end thereof and underlying a portion of the crankshaft pulley, said flange having an arcuate portion struck from a location offcenter from the axis of the crankshaft to provide clearance for the obliquely extending side of the timing belt extending from said crankshaft pulley.

4,559,911
MODIFICATION OF DIESEL ENGINE PRECOMBUSTION CHAMBER TO ATTENUATE DETONATION AND IMPROVE COMBUSTION

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 929,165, Jul. 28, 1978, Pat. No. 4,393,830. This application May 16, 1980, Ser. No. 150,456
Int. Cl.[4] F02B *27/00*
U.S. Cl. 123—271 9 Claims



1. In a diesel engine having a precombustion chamber with an arcuate wall so as to provide a rotary turbulent flow path for air flowing thereto from the main combustion chamber, the improvement comprising:
acoustical attenuator means having a high attenuative response to the gas vibrational energy present in said precombustion chamber, comprising a plurality of attenuator pockets spaced at predetermined locations around said precombustion chamber, apertures formed in the portions of the wall of the chamber opposite each of said pockets to provide fluid communications between the precombustion chamber and said pockets, and pellets of an acoustically attenuative material coated with a catalytic material contained within said pockets, and
means for positioning said attenuator means around a predetermined portion of said precombustion chamber in a region thereof where maximum attenuation to said energy is provided.

4,559,912
SPEED LIMITING DEVICE OF ENGINE AND/OR VEHICLE

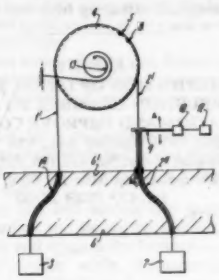
Dov Larom, Tel-Aviv, and Gabriel Shahar, Ramat-Gan, both of Israel, assignors to Ellar B.M., Tel-Aviv, Israel

Filed Nov. 22, 1982, Ser. No. 443,832
Claims priority, application Israel, Nov. 22, 1981, 64333
Int. Cl.[4] F02D *31/00*
U.S. Cl. 123—350 3 Claims

1. A device ascertaining that a vehicle having an accelerator does not exceed a pre-set speed limit comprising:
a. first means for transferring the input movement from the accelerator to
b. pulley means for controlling the output movement of the accelerator;
c. second means for transferring said output movement to a speed control unit;
d. electrical means actuating said pulley means the moment the pre-set speed limit is reached;
e. means for pre-setting the desired speed limit;
f. wherein said first transferring means is an input cable secured to the accelerator at one end and to said pully means at the other end, and said second transferring means

is an output cable cable secured to the speed control unit at one end and to said pulley means at the other end; and

g. wherein each cable is disposed within a corresponding envelope, and wherein one end of each envelope of the input and output cables is secured to the chassis of the



vehicle, the other end of the envelope of the input cable is connected to the chassis of the device, and the other end of the envelope of the output cable is threaded through the chassis of the device and secured to a linearly moving carriage.

4,559,913

RELIABILITY ENSURING SYSTEM FOR INTERNAL COMBUSTION ENGINE

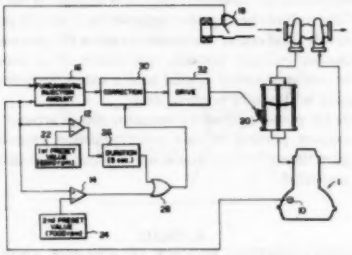
Yoshinobu Kido, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed May 14, 1984, Ser. No. 609,980

Claims priority, application Japan, May 17, 1983, 58-86879

Int. Cl.⁴ F02B 77/08

U.S. Cl. 123—352 **11 Claims**



1. A reliability ensuring system for an internal combustion engine comprising an operating state detecting means for detecting the value of an engine parameter to be controlled which is relevant to the output of the engine and which is controlled when it goes outside a normal region of predetermined values, a preset value generating means for generating a plurality of preset values for the value of the engine parameter to be controlled, said preset values corresponding to different degrees of upward deviation of said engine parameter to be controlled from said normal region, a comparing means for comparing the detected value of said engine parameter to be controlled with said preset values; an output signal generating means which generates an output signal when the detected value of said engine parameter to be controlled exceeds one of said preset values for a predetermined time interval, said predetermined time interval being determined for each preset value so that it increases as the degree of deviation of said engine parameter to be controlled from said normal region is reduced; and a control means for controlling at least one controlling engine parameter which affects the engine parameter to be controlled, said control means controlling said controlling engine parameter so as to move the value of said engine parameter to be controlled toward said normal region upon receipt of said output signal from said output signal generating means so that the output of the engine is controlled to move toward its lower region.

4,559,914

CONTROL DEVICE FOR INACTIVATING AN INTERNAL COMBUSTION ENGINE

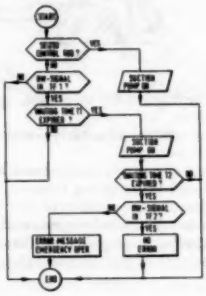
Ulrich Flaig, Markgröningen; Hermann Grieshaber, Stuttgart; Albrecht Sieber, Ludwigsburg, and Jürgen Wietelmann, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 633,096

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327157

Int. Cl.⁴ F02D 31/00

U.S. Cl. 123—359 **12 Claims**



1. A control device for stopping an internal combustion engine, particularly a Diesel engine, of type including a fuel supply tank, fuel injection means including a fuel injection pump provided with a suction chamber, a mechanism including a control rod for adjusting the amount of injected fuel, a fuel supply pump connected via a supply conduit between the fuel supply tank and the suction chamber of the fuel injection pump, and a suction device connected to the suction chamber to discharge fuel from the latter when activated in response to a malfunction of the fuel injection means, comprising checking means for testing the operation of the suction device, the checking means including means for activating the suction device when the engine is brought in an braking mode of operation, means for evaluating the reaction of the engine to the activation of the suction device, and means for stopping the engine when an error in the operation of the suction device is present.

4,559,915

METHOD OF CONTROLLING AIR-FUEL RATIO AND IGNITION TIMING IN INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

Tadahisa Naganawa, and Yoshihiko Matsuda, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1984, Ser. No. 590,053

Claims priority, application Japan, Apr. 8, 1983, 58-62816

Int. Cl.⁴ F02P 5/04

U.S. Cl. 123—406 **1 Claim**

1. Apparatus for controlling an air-fuel ratio and an ignition timing in an internal combustion engine, comprising:

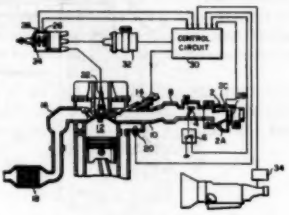
fuel injection control means for controlling an on-off timing of a fuel injection valve in accordance with fuel injection

time duration corresponding to the engine rotational speed and engine load;

ignition timing control means for controlling an on-off timing of an igniter in accordance with a spark advance angle corresponding to the engine rotational speed and engine load;

memory means for storing a target air-fuel ratio which is leaner than a stoichiometric air-fuel ratio, a stoichiometeric air-fuel ratio and an air-fuel ratio which is richer than the stoichiometric air-fuel ratio;

determining means for determining whether or not the engine load is within a predetermined range and the variation in the engine load is also within a predetermined range;



fuel injection correcting means for correcting the on-off timing of the fuel injection valve so that the air-fuel ratio approaches the target air-fuel ratio when said determining means determines that the engine load is within a predetermined range; and

ignition timing correcting means for correcting the on-off timing of the igniter so that the ignition timing approaches the required ignition timing corresponding to said target air-fuel ratio when said determining means determines that the engine load is within a predetermined range and the variation in the engine load is within a predetermined range.

4,559,916

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Kiyoshi Ookawa, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

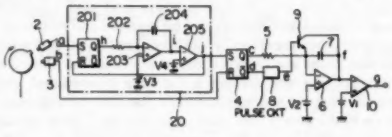
PCT No. PCT/JP82/00341, § 371 Date Apr. 14, 1983, § 102(e) Date Apr. 14, 1983, PCT Pub. No. WO83/00902, PCT Pub. Date Mar. 17, 1983

PCT Filed Aug. 26, 1982, Ser. No. 491,955

Claims priority, application Japan, Aug. 28, 1981, 56-136460; Sep. 16, 1981, 56-147529; Sep. 16, 1981, 56-147536

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—418 **3 Claims**



1. An ignition apparatus for an internal combustion engine consisting of means for detecting an ignition position of a minimum ignition advance of an internal combustion engine, first detection means for detecting an ignition position of a maximum ignition advance of said internal combustion engine, a first circuit for charging a first capacitor between the detection of the ignition position of the minimum ignition advance and the detection of the ignition position of the maximum ignition advance, a second circuit for charging a second capacitor between the detection of the ignition position of the maximum ignition advance of said internal combustion engine and at latest the detection of the ignition position of the minimum igntion advance, a third circuit for discharging a voltage on said second capacitor to a third predetermined voltage V_3 till at latest a maximum ignition advanced position after one period is detected, second detection means for detecting a time point where a voltage on said first capacitor at the ignition position of the maximum ignition advance of said internal combustion engine is equal to the voltage on said second capacitor, holding means for holding the voltage on the first capacitor from a time point where the ignition position of the maximum ignition advance is detected to the time point where the voltages on said first and second capacitors are equal to each other, a fourth circuit for discharging said first capacitor after the termination of this holding time period till at latest a time point where the ignition position of the minimum ignition advance is detected, a fifth circuit for rapidly discharging the voltage on said first capacitor to a second predetermined voltage V_2 at latest upon detecting the ignition position of the minimum ignition advance, third detection means for detecting a time point where the voltage on said first capacitor is equal to a first predetermined voltage V_1, and means for advancing the ignition position, in succession, from a minimum ignition advanced position through the time point where the voltage on said first capacitor is equal to the first predetermined voltage V_1, the time point where the voltage on the first capacitor is equal to the voltage on the second capacitor and to the maximum ignition advanced position in accordance with a rise of the number of rotations of the engine.

4,559,917

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE EQUIPPED WITH EXHAUST GAS RECIRCULATION SYSTEM

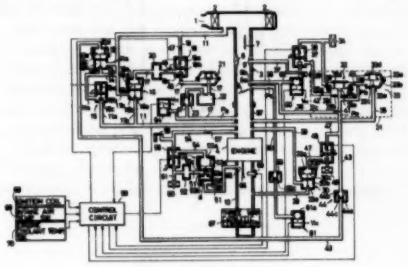
Shozo Toyama, Tokyo, and Fumio Yatabe, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,427

Claims priority, application Japan, Aug. 4, 1983, 58-121669[U]

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—571 **2 Claims**



1. An air intake side secondary air supply system for an internal combustion engine equipped with an exhaust gas recirculation system including an EGR passage connecting an exhaust gas passage and an intake air passage of said engine, an EGR flow control valve responsive to a pressure level in a first pressure chamber thereof being disposed in said EGR passage for varying the sectional area of said EGR passage, comprising:

an air intake side secondary air supply passage leading to said intake air passage, downstream of a throttle valve, for supplying atmospheric air;

an air control valve, responsive to a pressure level in a second pressure chamber thereof, disposed in said second-

ary air supply passage for varying the sectional area of said secondary air supply passage;

an air/fuel ratio determination means for determining the air/fuel ratio from composition of an exhaust gas flowing in said exhaust gas passage and producing therefrom an air/fuel ratio signal;

an open/close valve disposed in said air intake side secondary air supply passage, downstream of said air control valve, said open/close valve being adapted to open and close in response to said air/fuel ratio signal;

a control pressure source for supplying a first control pressure to said first pressure chamber of said EGR flow control valve via a first pressure supply passage;

a second pressure supply passage for joining said first pressure supply passage and said second pressure chamber of said air control valve; and

a delay means provided to one of said first and second pressure supply passages, for delaying the transmission of a pressure fluctuation in said second pressure chamber of said air control valve to said first pressure chamber of said EGR control valve, said pressure fluctuation being effectuated by the application of a vacuum of said intake air passage to said air control valve through said air intake side secondary air supply passage during transitory operating periods of said open/close valve.

4,559,918

BALL-THROWING DEVICE WITH BALL THROWING HEADS AND BALL CONVEYING SYSTEM INCLUDING Y-JUNCTION

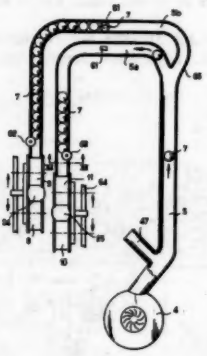
Jean-Paul Ballerin, Chatou; Alexandre Georgelin, Bois-Colombes, and Edmond Ballerin, Chatou, all of France, assignors to Faiveley Entreprises, Saint-Ouen, France

Filed Apr. 19, 1983, Ser. No. 486,304

Claims priority, application France, May 12, 1982, 82 08237

Int. Cl.⁴ A63B *69/00*; F41B *15/00*

U.S. Cl. 124—78 **3 Claims**



1. A device for throwing balls onto a playing area, said device being provided with ball-throwing heads comprising two pairs of rotating rollers placed in side-by-side relation, wherein means are provided for individual adjustment of the speed of rotation of each roller, wherein the rollers of each pair are spaced apart in order to form a gap which is adapted to be the diameter of the balls thrown thereby to permit each ball which is engaged within said gap to come into contact simultaneously with both rollers of each pair, wherein means are provided for conveying the balls to said gaps, said means comprising a main duct (**5**) connected to an air blower (**4**), said main duct (**5**) having a branch hose (**47**) for feeding balls to said main duct downstream of said blower (**4**) and being joined by the means of a Y-junction to two ducts (**5***a*, **5***b*) connected to each gap of the ball-throwing heads, each duct (**5***a*, **5***b*) comprising, near each gap, means (**62**) for arresting the balls in said ducts and for releasing said balls according to a predetermined sequence, each duct (**5***a*, **5***b*) being provided between said arresting means (**62**) and said Y-junction with a vent (**61**) the dimensions of which are adapted to be smaller than the diameter of a ball (**7**).

4,559,919

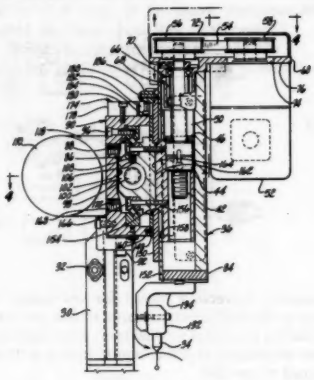
GRINDING WHEEL PROFILER

Anthony Kushigian, P.O. Box 768, Hendersonville, N.C. 28739

Filed Dec. 15, 1983, Ser. No. 568,211

Int. Cl.⁴ B24B *53/06*

U.S. Cl. 125—11 R **7 Claims**



1. A grinding wheel profiler apparatus comprising a housing, a first slide received within and carried by said housing for movement with respect to said housing along a first axis, a first lead screw within said housing and connected to one of said housing and first slide, a first nut engaging said first lead screw and connected with the other of said housing and first slide, at least two antifriction first ways each having first and second rails with said first rails connected to said first slide and said second rails connected to said housing, a carrier member carried by said first slide, a second slide carried by said carrier member for movement with respect to said first slide along a second axis essentially transverse to said first axis, a second lead screw received within said second slide and connected with one of said carrier member and second slide, a second nut engaging said second lead screw and connected with the other of said carrier member and second slide, at least two antifriction second ways each having first and second rails with said first rails connected to said second slide and said second rails connected to said carrier member, fasteners releasably securing together said first slide and said carrier member, passages through at least one of said housing and said second slide through which said fasteners can be inserted and removed, and plugs removably received in said passages to seal said passages when said plugs are received therein, a first seal plate carried by said housing and having a flat face constructed and arranged to bear on a complimentary flat face of a second seal plate carried by said first slide, said first seal plate having an aperture therethrough the perimeter of which encircles and first slide while permitting it to move along said first axis, a second seal plate carried by said first slide and having a flat face complimentary to, bearing on, and overlapped with said flat face of said first seal plate througout the extent of movement of said first slide along said first axis and a second flat face constructed and arranged to bear on a complimentary flat face of a third seal plate, a third seal plate carried by said second slide and having an aperture therethrough and a flat face complimentary to, bearing on, and overlapped with said second face of said second seal plate throughout the extend of movement of said second slide along said second axis, and said

housing, seal plates and slides are constructed and arranged such that the various components associated with said first slide and housing can be subassembled thereto, the various components associated with said second slide and carrier member can be subassembled thereto, said subassemblies can be releasably assembled together by said fasteners, and when assembled together said housing, seal plates and second slide provide an enclosure of said lead screws, nuts, ways and first slide and prevent contaminants from entering the enclosure while permitting both of said slides to move with respect to said housing.

4,559,920

BLADE-CARRYING FRAME FOR MACHINES FOR CUTTING MARBLE, GRANITE AND HARD STONE

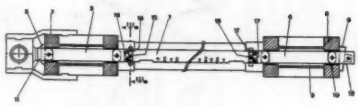
Marcello Toncelli, Bassano Del Grappa, and Walter Cado', Castelfranco Veneto, both of Italy, assignors to Breton S.p.A., Castello Di Godego, Italy

Continuation of Ser. No. 477,890, Mar. 23, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 687,979

Claims priority, application Italy, Apr. 23, 1982, 85556 A/82

Int. Cl.⁴ B28D *1/06*

U.S. Cl. 125—17 **2 Claims**



1. A blade-carrying frame with a pack of blades which may be removed in block from the frame which is mounted in a machine used for sawing marble, granite, hard stones and the like, said pack comprising a plurality of blades (1), a plurality of spacer elements (2) interposed between adjacent blades, tie rods (3) and (4) connected to respective ends of said plurality of blades (1), said tie rods (3) and (4) also being respectively connected to heads (7) and (8) of said frame, a plurality of wedge-shaped inserts (6) connected to said tie rod (4) which function to hold the blades under tension against the head (8) of the frame, said heads (7) and (8) having respective openings (9) and (10) for receiving said tie rods, said openings being unobstructed upon removal of said inserts and being of sufficient size whereby the entire pack of blades may be non-destructively removed in one piece from the frame through the head (8) opening and a new pack of blades inserted in its place through said opening.

4,559,921

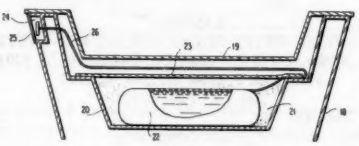
SELF-HEATING RECEPTACLE

Simon Benmussa, 94, Bd Pape Jean 23, 06300 Nice, France

Division of Ser. No. 439,409, Nov. 5, 1982, Pat. No. 4,510,919. This application Jan. 10, 1985, Ser. No. 690,468

Int. Cl.⁴ F24J *1/02*

U.S. Cl. 126—263 **8 Claims**



1. A self-heating receptacle comprising a vessel for food to be heated, and below said vessel a container sealed by a lid containing two chemicals which are regents in an exothermic reaction, a pouch within said container in which one of said chemicals is sealed from the other chamical, and a flexible tearing filament for simultaneously opening the pouch and opening said container thereby to permit said chemicals to contact each other and to take part in said exothermic reaction thereby to heat said food vessel, said tearing filament being connected to said pouch and so arranged that upon pulling said tearing filament, said tearing filament creates a line of tear across both the pouch and the lid.

4,559,922

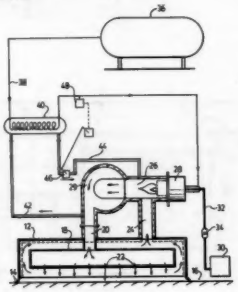
MACHINE FOR SOFTENING AN ASPHALT ROAD SURFACE

Franco A. Crupi, 15 Croxley Green, Markham, Ontario, Canada L3R 3T5; Christopher Bzowski, 5 Mistflower Rd., Willowdale, Canada (M2H 3G8), and Ernest R. Measures, 139 Churchill Ave., Willowdale, Canada M2N 1Z3

Filed Oct. 1, 1984, Ser. No. 656,281

Int. Cl.⁴ F23C *5/00*

U.S. Cl. 126—271.2 A **5 Claims**



1. A machine for softening an asphalt road surface comprising:

a housing having a bottom peripheral wall positionable in engagement with a road surface,

gas heating means,

the housing containing a plenum chamber for receiving hot gas from the gas heating means, said plenum chamber having a bottom wall with apertures through which hot gas passes from the plenum chamber into contact with the road surface,

duct means for conveying hot gas from the gas heating means to the plenum chamber and for recycling gas from the housing after contact with the road surface to the gas heating means for reheating, and

fan means for circulating gas through the duct means.

4,559,923

CERAMIC STOVE

Manfred Goetz, 7914 Turtle Valley Dr., Clifton, Va. 22024

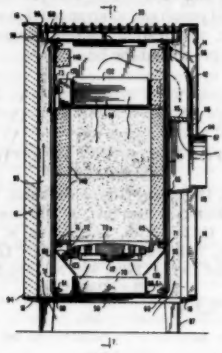
Division of Ser. No. 242,151, Mar. 9, 1981, Pat. No. 4,455,993. This application Apr. 27, 1984, Ser. No. 604,871

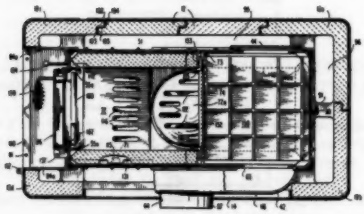
Int. Cl.⁴ F23J *11/00*

U.S. Cl. 126—307 R **7 Claims**

1. A firebox for a stove comprising a base, a plurality of walls upstanding from the base and a top wall defining a combustion chamber, one of said upstanding walls having an exhaust port in an upper section thereof, a pan-like flue structure attached to said one wall on the outer side thereof and defining therewith an elongated flue passage, one end of said flue structure covering said exhaust port, said flue structure extending from said one end thereof downwardly along said one wall of said firebox and terminating in an outlet located at a level

below the level of the exhaust port, and a heat shield mounted relative to the firebox outwardly of said one wall and covering





said flue structure, said heat shield having an opening in registry with the outlet of said flue structure.

4,559,924

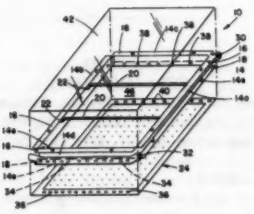
THIN FILM ABSORBER FOR A SOLAR COLLECTOR

William G. Wilhelm, Cutchogue, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 347,215, Feb. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 96,260, Nov. 20, 1979, Pat. No. 4,327,707. This application Feb. 27, 1984, Ser. No. 582,163

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—426 **4 Claims**



1. A solar collector comprising:

(a) a perimetric frame defining a substantially open central portion having two spaced, substantially planar sides, said frame also having an internal perimetric flange;

(b) thin plastic film glazing substantially congruent to said frame covering said sides and fastened to said frame whereby said frame and said glazing cooperate to form a light-weight, high-strength monocoque structure;

(c) an absorber comprising two substantially congruent thin films being bonded together around their edges to form an envelope having a high surface area to volume ratio, said envelope having a first opening for the introduction of a heat transfer fluid into said envelope and a second opening for the removal of said fluid from said envelope, which absorber is substantially congruent with and fastened to said internal flange so that said absorber is parallel with and spaced from said sides; and

(d) manifold means for providing a flow of heat transfer fluid through said absorber.

4,559,925

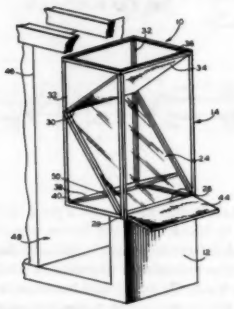
SOLAR COLLECTOR ASSEMBLY

Corinne M. Snow, 47 Sunset Dr., Delmar, N.Y. 12054

Filed Apr. 30, 1984, Ser. No. 605,299

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—430 **10 Claims**



1. A self contained solar collector assembly for installing in the side of a building comprising:

a transparent window having upper and lower ends, the window being inclined with respect to horizontal at an angle to substantially maximize direct transmission of available winter solar rays through the window;

a fixed upper panel extending outwardly at a right angle to the window, said upper panel being non-transmissive to solar rays and serving to shade the window from the sun's rays during the summer;

a fixed lower panel extending inwardly at a right angle to the window, said lower panel having a solar ray reflective surface portion for reflecting inwardly substantially all of the solar rays transmitted through said window and incident upon said surface portion; and

frame means for supporting the window and upper panel and lower panel in fixed relationship and for mounting the solar assembly in the side of the building.

4,559,926

CENTERLESS-DRIVE SOLAR COLLECTOR SYSTEM

Barry L. Butler, 13525 Portofino Dr., Delmar, Calif. 92014

Filed Oct. 3, 1984, Ser. No. 657,187

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 126—438 **7 Claims**

1. A solar collector system comprising:

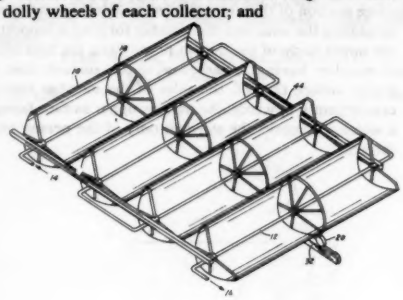
(a) a frame;

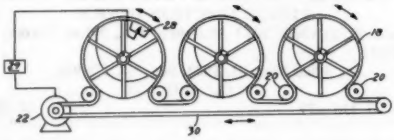
(b) a number of solar collectors, each collector mounted by pivots at both ends of the frame, so as to allow rotation of the collector about its longitudinal axis;

(c) each collector having a drive ring attached thereto, the longitudinal axis of the collector perpendicular to the plane of the drive ring;

(d) for each collector, dolly wheels rotatably attached to the frame, and supporting the drive ring;

(e) a flexible belt routed over the drive ring and under the dolly wheels of each collector; and





(f) drive means for simultaneously rotating the collectors by applying a rotational torque to the drive rings by means of the belt.

4,559,927

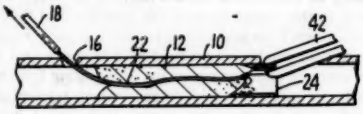
ENDARTERECTOMY APPARATUS AND PROCESS

Albert K. Chin, San Francisco, Calif., assignor to Thomas J. Fogarty, Palo Alto, Calif.

Division of Ser. No. 97,206, Nov. 26, 1979, Pat. No. 4,290,427. This application Jun. 15, 1981, Ser. No. 273,920

Int. Cl.⁴ A61B *17/32*

U.S. Cl. 128—1 R **3 Claims**



1. A method for excising arteriosclerotic occlusions from arteries comprising positioning an annular cutting knife within an artery in position to excise an occlusion upon movement of said knife along said artery, said knife being split longitudinally and having overlapped end portions, said knife being radially compressible and expansible while said end portions are overlapped and having a wire carrier fixedly attached thereto along substantially the central axis thereof, and pulling said carrier through a distal incision in said artery.

4,559,928

ENDOSCOPE APPARATUS WITH MOTOR-DRIVEN BENDING MECHANISM

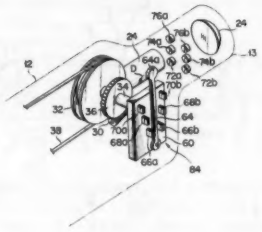
Syuichi Takayama, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 435,707, Oct. 21, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,657

Claims priority, application Japan, Oct. 22, 1981, 56-168949; Oct. 22, 1981, 56-168950

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. an endoscope apparatus comprising:

(a) an elongated insertion section adapted to be inserted into a body cavity and freely bendable therein in a desired direction;

(b) a main body, and an eyepiece section, both coupled to said insertion section;

(c) motor means in said main body for receiving electric power and for generating torque to bend said insertion section;

(d) bending means mechanically connected to said motor means and said insertion section, for bending said insertion section in accordance with the torque generated by said motor means;

(e) an operation member provided at said endoscope main body and including a lever member to be manually operated by an operator;

(f) bending speed controller means connected to said motor means and to said lever member and including level displacement detecting means disposed near said lever member for electrically detecting displacement of said lever member, said lever displacement detecting means consisting of a material the conductivity of which increases with increased pressure, said lever displacement detecting means including a plurality of detecting portions pressed in an order corresponding to the displacement of said lever member, and transistor circuit means connected to said lever displacement detecting means and said motor means for continuously increasing the power supplied to said motor means, between a minimum and a maximum level, in accordance with the displacement of said lever member, and

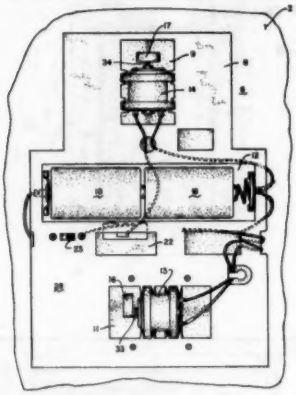
(g) bending speed indicator means arranged in said eyepiece section and electrically connected to said lever member and said lever displacement detecting means, said bending speed indicator means comprising a plurality of light-emitting devices provided in said eyepiece section and which increase the amount of light emitted thereby, substantially in proportion to the displacement of said lever member, for indicating to the operator the actual speed level of said insertion section while looking in the eyepiece section, based on the amount of electrical power supplied to said motor means.

4,559,929

MASSAGE DEVICE

Victor C. Hseu, St. Louis, Mo., assignor to Hyman Products Co., Inc., Maryland Heights, Mo.

Filed May 21, 1984, Ser. No. 612,727
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—33 **2 Claims**



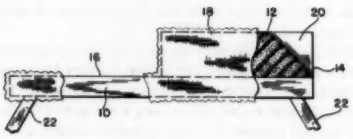
1. A massage pillow comprising a pillow member of resilient foam material, said pillow member having a cavity therein and having an access passage on one side thereof in communication with said cavity; a retaining frame disposed within said cavity, said retaining frame including a planar upper surface and a pair of spaced outer recessed cradles and an intermediate recessed cradle therebetween, said cradles being recessed to different depths with respect to said upper surface; a pair of vibrator motors mounted in said outer recesses, said motors having drive shafts lying parallel to said upper surface of said retaining frame, and weighted fly wheels eccentrically mounted directly on said drive shafts, the axis of rotation of the drive shaft of one vibrator motor being normal to the axis of rotation of the drive shaft of the other vibrator motor and disposed in different planes relative to the plane of said upper surface of said retaining frame; a battery pack disposed in said intermediate recessed cradle of said retaining frame between said vibrators; a switch disposed on said retaining frame adjacent said battery pack; a flat switch actuating plate disposed within said cavity on one side of said pillow to abut said first switch and actuate the same when said pillow is compressed, and an electrical circuit connecting said battery and switch.

4,559,930

THORACIC BENCH

John F. Cobiski, Box 189, Rte. 20, Charlton, Mass. 01507

Filed May 7, 1984, Ser. No. 607,976
Int. Cl.[4] A61G *13/00*
U.S. Cl. 128—70 **3 Claims**



1. A bench for cervical treatment comprising a narrow elongated horizontal support, legs for the support raising it to a predetermined elevation,

a narrow elongated block member on and parallel to the support, said member being shorter than the support and located at an end portion thereof, leaving one opposite end portion of the support free for a person to straddle while facing the member,

the free portion of the support forming a seat for the person straddling the same and the member forming a support for the upper body of the person prone from the hips up,

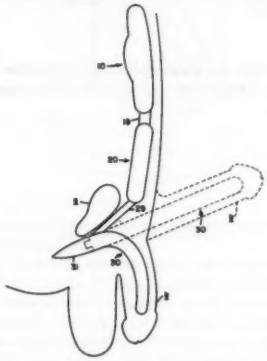
said member having a narrower upper surface than the lower surface thereof, the sides of the member tapering convergently upwards, the narrow upper surface being of a width to support the sternum only of the person prone thereon.

4,559,931

MANUALLY ACTUATED FULLY IMPLANTABLE PENILE ERECTION DEVICE

Robert E. Fischell, 1027 McCeney Ave., Silver Spring, Md. 20901

Filed Mar. 21, 1983, Ser. No. 476,931
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—79 **14 Claims**

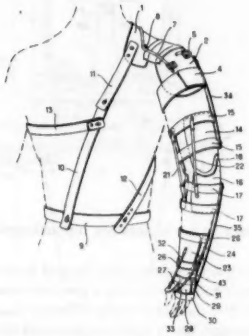


1. A penile erection device that is fully implantable in a patient and that includes stiffener means adapted for implantation in the body of the penis which adopts an erect state when pressurized to a first pressure and which adopts a flaccid state when pressurized to a lower second pressure; actuator means including an elastomeric surface adapted for depression from external to the patient to raise the pressure of a fluid in said stiffener means from said second to said first pressure; connecting means for establishing a fluid path between said stiffener means and said actuator means for transmitting fluid between said actuator means and said stiffener means; releaser means in the path of said connecting means, including a valve, and adapted for direct manual actuation from external to the patient to act on the valve and lower the pressure in said stiffener means from said first to said second pressure; the depressed elastomeric surface of said actuator means and the valve of said releaser means cooperating with said stiffener means so that when said stiffener means is in its erect state, a negative pressure is developed in a portion of said releaser means, serving both to urge the valve of said releaser means into a position to maintain the erect state and to rapidly drop the pressure in the stiffener means from said first to said second pressure when the releaser means is manually actuated.

4,559,932
EXTERNAL APPARATUS FOR MOTOR HANDICAPS OF AT LEAST ONE UPPER LIMB

Guy J. Salort, 219, rue Raymond Losserand, 75014 Paris, France

Filed Nov. 29, 1983, Ser. No. 556,122
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—77 **20 Claims**



1. An external apparatus for overcoming motor handicaps of at least one upper limb of a human subject, to allow the said subject to move his handicapped limb, such apparatus comprising, for each handicapped limb:

(a) a thoraco-scapular structure constituted by first and second thoraco-scapular sub-assemblies;

(b) said first thoraco-scapular sub-assembly being in the form of shoulder brace means comprising

(b1) at least three semi-rigid shells,

(b2) means interconnecting said semi-rigid shells in a flexible manner, with said first semi-rigid shell disposed over the upper angle of the pectoral muscle and passing over the upper edge of the trapezius of the subject, said second semi-rigid shell disposed over the claviculo-trapezoidal zone at the top of the shoulder of the subject, and said third semi-rigid shell disposed opposite the scapula of the subject; and

(b3) elastic tensioner means between said second semi-rigid shell and each of said first and third semi-rigid shells;

(c) said second thoraco-scapular sub-assembly being in the form of an attachment sub-assembly to be disposed around the torso of the subject and connected to the shoulder brace at at least two attachment points distributed on either side of the shoulder of the subject;

(d) said apparatus comprising, in addition to said first and second thoraco-scapular sub-assemblies, a para-skeleton for the upper limb and for the hand of the subject, said para-skeleton comprising:

(d1) first connection means to connect to the said limb of the subject and at the upper humeral part thereof,

(d2) second connection means to connect to the limb of the subject at the lower humeral part thereof,

(d3) third connection means to connect to the limb of the subject at the upper cubito-radial part thereof,

(d4) fourth connection means to connect to said limb of the subject at the lower cubito-radial part thereof, and

(d5) fifth connection means to connect to the hand of the subject; wherein said first connection means comprises said second shell of the shoulder brace means and a peripheral strap which surrounds the said limb of the subject, and wherein each of the said first, second, third and fourth connection means comprises a semi-rigid shell each made of at least one piece, and at least one peripheral strap which surrounds the said limb; and

(d6) elastic means disposed between two of said first, second, third, fourth and fifth connection means;

(e) wherein said elastic means comprises:

(e1) a first spring lever operating in the flexural and torsional modes,

(e2) means fixing said first spring lever between the second shell of the shoulder brace means and the said semi-rigid shell of the second connection means with said first spring lever substantially parallel to the humerus along the outer edge of the limb of the subject;

(e3) a second spring lever analogous to said first spring lever,

(e4) means fixing said second spring lever between said shell of the third connection means and the shell of the fifth connection means with said second spring lever substantially parallel to the cubitus along the inner edge of the limb of the subject;

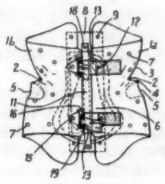
(e5) two elastic tensioners disposed over the outer and inner edges of the arm of the subject, between said second and third connection means; and

(e6) two elastic tensioners disposed between said fourth and fifth connection means.

4,559,933
ORTHOPAEDIC LUMBO-SACRAL CORSET WITH SEMI-RIGID ELEMENTS AND INFLATABLE PADS

Denis Batard, Nantes; Jean-Claude Freland; Bernard Wallez, both of Basse-Goulaine; J. Paul Desffains, Orvault, and Roger Valle, Saint Herblain, all of France, assignors to S.A. Arlux, Orvault, France

Filed Jun. 23, 1983, Ser. No. 507,065
Claims priority, application France, Jul. 1, 1982, 82 11555
Int. Cl.[4] A61F *5/02*
U.S. Cl. 128—78 **8 Claims**



1. An orthopaedic lumbo-sacral corset made of the assembly of semi-rigid elements and an inflatable pad comprising two side half-shells of a semi-rigid plastic material, connected along the adjacent dorsal edges by a semi-rigid thin band forming a hinge adapted to be generally aligned with the spine of the wearer, with attachment and tightening means between the adjacent front edges of the two half-shells and an inflatable lumber pad formed by two pads symmetric relative to and adjacent the hinge.

4,559,934
FOREFOOT ELEVATING DEVICE FOR PERONEAL NERVE DYSFUNCTION CASES

Alexander Philipp, Garbsen, Fed. Rep. of Germany, assignor to C. Nicolai GmbH & Co. KG, Hanover, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,788
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307815
Int. Cl.[4] A61P *3/00*
U.S. Cl. 128—80 E **20 Claims**

1. Apparatus for elevating the forefoot in peroneal dysfunction cases comprising in operative combination:

(a) a sock adapted to tightly fit the foot of the user;

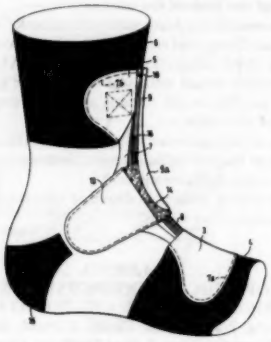
(b) a plate anatomically conforming to the dorsal surface of the foot having a forefoot end and a tibial end;

(c) said dorsal plate being disposed in engagement with a dorsal surface of the sock;

(d) said dorsal plate having spring-like properties of elastic yieldability;

(e) elastic connector means disposed connectably adjacent the forefoot end and tibial end of said dorsal plate;

(f) said elastic connector means providing an adjustable bias tension between the forefoot and lower tibial portion of the user's leg; and



(g) said assembly in combination permitting: use with or without normal footwear, overtensioning to compensate for footwear weight, adjustment of the angle of respose of the foot, and lateral foot stability.

4,559,935

FRACTURE CAST BRACES

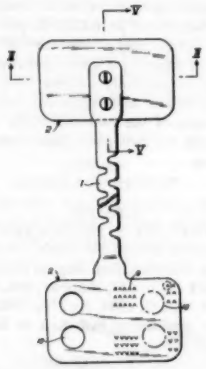
David E. Young, Watlington, and David H. Boyes, Childwall, both of England, assignors to Universal House, Stokenchurch, England

Continuation-in-part of Ser. No. 458,178, Jan. 17, 1983, Pat. No. 4,467,792. This application Jun. 4, 1984, Ser. No. 616,834

Claims priority, application United Kingdom, Nov. 18, 1982, 8232996; European Pat. Off., Nov. 18, 1983, 83.307085.7

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—88 **17 Claims**



1. A head plate adapted to bond to casting material for use in conjunction with a flexible hinge part having a connecting portion to form a hinge brace for a fracture cast, the head plate comprising a body with a central portion having substantially continuous, uninterrupted upper and lower surfaces and a side portion, a slot formed in said central portion, within the interior of said body and opening at said side portion, said slot being of substantially the same dimension as the connecting portion and adapted to receive same therein.

4,559,936

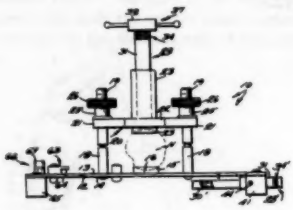
BONE PLUGGING APPARATUS

Edward B. Hill, 700 Luzerne St., Johnstown, Pa. 15905

Filed Sep. 29, 1983, Ser. No. 536,972

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 R **19 Claims**



1. An apparatus for facilitating hip arthroplasty, or the like, comprising:

a rod having first and second enlarged generally disc-shaped ends, each end disc having a predetermined diameter, the first end disc diameter being different than the second end disc diameter; linear calibrating indicia formed on said rod at predetermined distances from each of the ends thereof; and correlating indicia associated with each of said ends, the indicia for the first end distinct from that for the second end; and

first and second hollow bone cutting tools of different effective internal diameter, the first tool having an internal diameter substantially identical to the diameter of the rod first end disc diameter, and said first tool having correlating indicia corresponding to that for the rod first end; said second tool having an effective internal diameter substantially identical to the diameter of the rod second end disc diameter, and having correlating indicia corresponding to that for said rod second end.

4,559,937

FLUID COLLECTION BAG WITH A SCREEN FOR A SURGICAL DRAPE

Kenneth D. Vinson, Cincinnati, Ohio, assignor to The Kendall Company, Boston, Mass.

Filed Apr. 27, 1983, Ser. No. 488,920

Int. Cl.[4] A61F *13/00*; A61M *1/00*

U.S. Cl. 128—132 D **3 Claims**

1. A fluid collection bag constructed of a flexible, fluid impervious sheet material comprising:

(a) a front panel having a top edge, a left side, a right side, and a bottom edge;

(b) a back panel having a top edge, a left side, a right side, and a bottom edge, said left and right sides, and said bottom edges being closed;

(c) a first opening formed by the open top edges of said front and back panels;

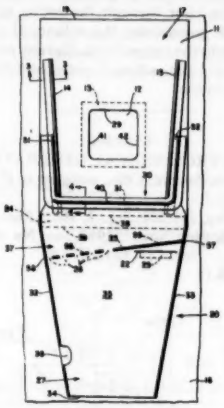
(d) an upper chamber in fluid communication with said first opening;

(e) a lower chamber in fluid communication with said upper chamber;

(f) a screening means located between said upper chamber and said lower chamber, said screening means comprising a line of adherence between said front panel and said back panel extending from said closed left side to said closed right side, said line of adherence having nonadhered gaps therein; and

(g) a second opening means in the upper portion of said lower chamber in said front panel, said second opening being located immediately beneath said screening means

and adjacent one of said closed sides so as to prevent direct flow of fluid by gravity to said second opening and



to enable the insertion of fluid discharge means and the measurement and sampling of fluid.

4,559,938

ADHESIVE DRESSING AND COMPONENTS

Peter J. Metcalfe, Bishops Stortford, United Kingdom, assignor to Smith and Nephew Associated Companies p.l.c., Great Britain

Filed Aug. 11, 1982, Ser. No. 406,988

Claims priority, application United Kingdom, Aug. 12, 1981, 8124649

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 128—156 **16 Claims**

1. A flexible film suitable for use in adhesive medical dressings which film comprises a blend of polymers which comprises a continuous matrix of 1,2 polybutadiene and an incompatible polymer which forms a discrete particulate phase within the continuous matrix and the film contains voids whereby said voids provide means for moisture vapor transmission but not liquid permeability.

4,559,939

COMPATIBLE SMOKE AND OXYGEN MASKS FOR USE ON AIRCRAFT

Harold H. Levine, Northridge; Peter P. Kavaloski, Los Angeles, and Thomas K. Hale, Glendale, all of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Feb. 13, 1984, Ser. No. 579,238

Int. Cl.⁴ A62B *7/00*

U.S. Cl. 128—201.28 **10 Claims**

1. An improvement to a windowed smoke mask and oxygen mask, said oxygen mask of the type comprising a hollow flexible cup having a substantially flat end surface, said end surface incorporating an oxygen inlet port, a vent port, a cabin air inlet port, and a flexible mounting strap mounted thereto, said smoke mask and said oxygen mask for use by passengers in an aircraft cabin, said aircraft having a source of pressurized fresh air and oxygen gas, the improvement being a system for coupling said oxygen mask to said smoke mask comprising:

a protrusion mounted on the front of said smoke mask, said protrusion having a substantially flat face, said protrusion adapted to receive said oxygen mask;

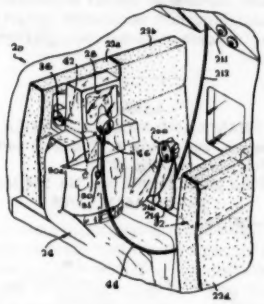
a vent valve means mounted on said flat face of said protrusion in a manner such that it is aligned and coupled to said vent valve of said oxygen mask when said oxygen mask is mounted on said protrusion;

an inlet valve means biased to the closed position mounted on said flat face of said protrusion, said inlet valve means having an actuation button protruding to the exterior thereof, said intake valve means mounted in such a manner that it is aligned and coupled with said oxygen inlet valve of said oxygen mask when said oxygen mask is mounted on said protrusion;

plug means mounted on said flat face of said protrusion adapted to plug said cabin air inlet valve on said oxygen mask when said oxygen mask is mounted to said protrusion;

a conduit means coupled to said source of fresh air;

disconnect valve means coupling said conduit means to said interior of said smoke mask adapted, when actuated, to



disconnect said conduit means from said face mask and further adapted to seal off the interior of said smoke mask;

lanyard means coupled to said disconnect valve means adapted when actuated to actuate said disconnect valve means;

attachment means coupled to both said smoke mask and said oxygen mask adapted to attach said oxygen mask to said smoke mask; and

alignment means coupled to both said smoke mask and said oxygen mask adapted to align said oxygen inlet valve, said vent valve and said cabin air inlet valve of said oxygen mask with said intake valve means, said vent valve means and said plug means, respectively, of said smoke mask when said oxygen mask is mounted to said protrusion.

4,559,940

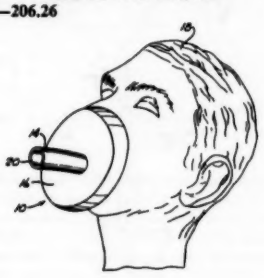
RESUSCITATION APPARATUS

Gerald E. McGinnis, 131 Kelvington Dr., Monroeville, Pa. 15146

Filed Feb. 6, 1984, Ser. No. 577,542

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—206.26 **19 Claims**



1. In a gas delivery apparatus including a gas flow conducting means and adapted for delivery of medical gas to a patient

from an external gas source through the patient's mouth via the gas flow conducting means which extends into the patient's mouth and further including seal means adapted to seal the patient's mouth and nasal openings from the ambient atmosphere, the improvement comprising:

said seal means comprising deformable means encompassing said gas flow conducting means and including a formable exterior wall disposed for confronting relationship with the patient's face throughout an area of contact having an outer perimeter which encompasses the patient's mouth and nasal openings such that said area of contact extends continuously intermediate said gas flow conducting means and said outer perimeter, said formable exterior wall being adapted to conform to the patient's facial contours throughout said area of contact to provide a continuous surface seal throughout said area of contact for sealing of the patient's mouth and nasal openings from the ambient atmosphere.

4,559,941

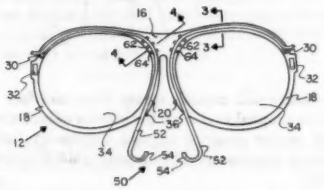
EYEGLASS FRAME AND NASAL CANNULA ASSEMBLY

John W. Timmons, and Gloria A. Timmons, both of 8390 W. Country Club, Sarasota, Fla. 33580

Filed Dec. 22, 1983, Ser. No. 564,186

Int. Cl.⁴ A61M *15/08*

U.S. Cl. 128—207.18 **18 Claims**



1. An eyeglass frame with a concealed nasal cannula assembly, comprising:

(a) an eyeglass frame having a front piece and a pair of hinged temples, said front piece having a groove in its rear surface; and

(b) a nasal cannula assembly fitted in said groove.

4,559,942

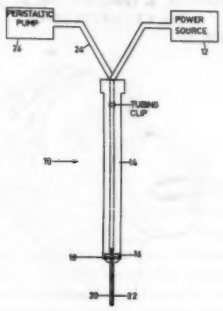
METHOD UTILIZING A LASER FOR EYE SURGERY

William Eisenberg, 16 Park Ave., New York, N.Y. 10016

Filed Feb. 29, 1984, Ser. No. 584,923

Int. Cl.⁴ A61B *17/36*

U.S. Cl. 128—303 **4 Claims**



1. A method for eye surgery on target tissue in the eye including the steps of coupling a laser to a surgical probe apparatus defining a radiation inlet and a radiation outlet, moving the probe apparatus adjacent to the target tissue in the eye, injecting a precisely controllable volume of air between the radiation outlet and the target tissue, and providing laser radiation from the laser through the probe apparatus to the target tissue while maintaining the volume of air between the probe apparatus and the target tissue, thereby to prevent physical contact between the radiation outlet and the target tissue during laser irradiation.

4,559,943

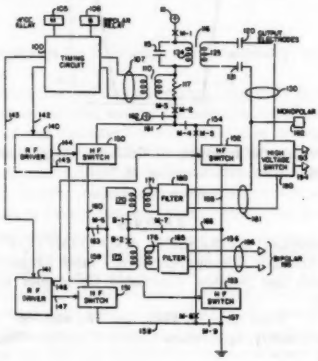
ELECTROSURGICAL GENERATOR

William J. Bowers, Aurora, Colo., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Division of Ser. No. 299,204, Sep. 3, 1981, Pat. No. 4,438,766. This application Nov. 2, 1983, Ser. No. 547,964

Int. Cl.⁴ A61B *17/39*

U.S. Cl. 128—303.14 **11 Claims**



1. In a electrosurgical generator for performing an electrosurgical operation which requires a periodically interrupted waveform, said generator having output circuitry for connection to a patient and means controllable by an operating surgeon for selecting said electrosurgical operation, the improvement comprising:

power amplifier means responsive to said selecting means for selectively generating a periodically interrupted rectangular waveform with a fundamental frequency, duty cycle, current and voltage suitable for performing said electrosurgical operation; and

filter means responsive to said rectangular waveform for converting said rectangular waveform to an output waveform suitable for performing said electrosurgical operation and for providing said ouput waveform to said output circuitry, said filter acting as a voltage doubler and producing an output wave form having a peak voltage equal to twice the peak voltage of said rectangular waveform.

4,559,944

SURGICAL INSTRUMENT FOR GYNECOLOGICAL PROCEDURES

John C. Jaeger, 3584 Batavia-Elba TLR, Oakfield, N.Y. 14125

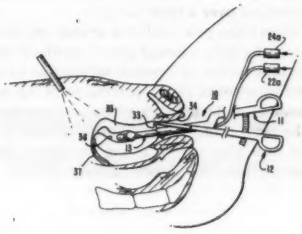
Filed Apr. 5, 1984, Ser. No. 597,053

Int. Cl.⁴ A61B *17/28*

U.S. Cl. 128—344 **29 Claims**

1. A surgical instrument suitable for use in performing gynecological procedures comprising a first forceps lever having a forwardly disposed section insertable into a vaginal cavity, an intermediate section and a rearwardly disposed handle section, a second forceps lever having a forwardly disposed section insertable into said vaginal cavity with the insertable section of said first forceps lever, an intermediate section pivotally connected to the intermediate section of said first forceps lever and

a rearwardly disposed handle section cooperable with the handle section of said first forceps lever, said insertable section of said first forceps component having a longitudinally disposed bore, a plunger disposed in said longitudinally disposed bore and displaceable longitudinally therein, insertable in the uterine canal when the insertable sections of said forceps levers are inserted into said vaginal cavity, means disposed on said



plunger and expandable to engage the wall of said uterine canal and provide an expansive bearing contact therewith, and the insertable section of said second forceps lever having a lip portion engageable with the cervix of the uterus when the insertable sections of said forceps levers are inserted in said vaginal cavity, said plunger is inserted in said uterine canal and said handle sections are moved together causing the cervix to be clamped to said instrument.

4,559,945

ABSORBABLE CRYSTALLINE ALKYLENE MALONATE COPOLYESTERS AND SURGICAL DEVICES THEREFROM

Donald Koelmel, and Shalaby W. Shalaby, both of Lebanon, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 21, 1984, Ser. No. 652,706
Int. Cl.[4] A61L *17/00*
U.S. Cl. 128—335.5 **14 Claims**

1. A surgical filament comprising a drawn and oriented copolyester comprising repeating divalent units of the formulas:

(A) —O—CO—CH_2—CO—O—

(B) —G—, and at least one of the following (C), (D), or (E):

(C) —O—CO—CH_2—O—CH_2CH_2—

(D) —CH_2—CO—O—

(E) —$CH(CH_3)$—CO—O—

wherein G represents the residue after removal of the hydroxyl groups of a dihydric alcohol, and wherein the divalent units (A) through (E) are bonded to each other by ester groups formed by linking said units.

4,559,946

METHOD AND APPARATUS FOR CORRECTING ABNORMAL CARDIAC ACTIVITY BY LOW ENERGY SHOCKS

Morton M. Mower, Lutherville, Md., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Jun. 18, 1982, Ser. No. 389,907
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D **13 Claims**

1. An apparatus for converting a relatively disorganized arrhythmia to normal sinus rhythm through the intermediary of a more organized arrhythmia having a repeatable characteristic, said apparatus comprising:

sensing electrode means for monitoring the electrical activity of the heart as an ECG signal;

detecting means receiving said ECG signal for detecting the disorganized arrhythmia;

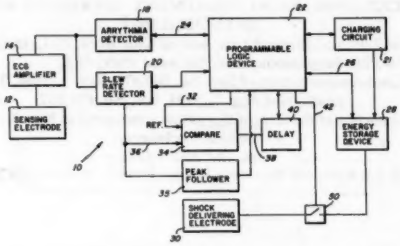
shock delivering electrode means adapted to be secured to the heart;

energy storage means for storing sufficient energy to deliver a low-level shock;

charging means for charging said energy storage means;

discharge means responsive to the presence of the disorganized arrhythmia for causing said energy storage means to deliver a first low-level shock to the heart to bring about the more organized arrhythmia exhibiting a repeatable characteristic;

determining means for determining whether the heart has returned to normal sinus rhythm;



means for activating said charging means when said determining means indicates that the heart has not returned to sinus rhythm and then activating said discharging means for repeatedly delivering further low-level shocks to the heart over a predetermined time period until the heart returns to sinus rhythm; and

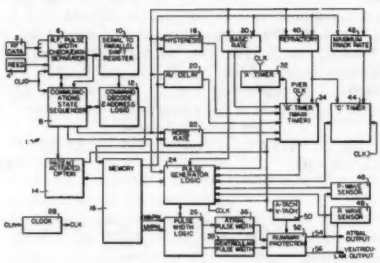
means for synchronizing the delivery of said further shocks to the repeatable characteristic of the more organized arrhythmia.

4,559,947

CARDIAC TISSUE STIMULATOR PROVIDING P-WAVE VERIFICATION, TELEMETRY, MARKER CHANNELS, AND ANTITACHYCARDIA CAPABILITIES

Herman L. Renger, 2790 Stokes Canyon Rd., Calabasas, Calif. 91302; Brian M. Mann, 12079 Beaufait, Northridge, Calif. 91326, and John Meador, 1117 Red Bud Trail, Austin, Tex. 78746

Filed Jan. 27, 1984, Ser. No. 574,707
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **39 Claims**



1. In a cardiac tissue stimulator that includes means for generating stimulation pulses that are delivered to cardiac tissue, and means for sensing electrical activity at or within said cardiac tissue, a means for determining whether sensed electrical activity from said cardiac tissue is verified electrical activity or noise, said means for determining including:

means for defining a first time period within which electrical activity may be sensed;

verification means for defining a verification period, said verification period being intitiated by the beginning of sensed electrical activity within said first time period;

signaling means for signaling, once said verification means is initiated, whether the sensed electrical activity lasts for a time period that is longer than said verification period, in which case the sensed electrical activity is considered to be verified electrical activity, or whether the sensed electrical activity lasts for a time period that is shorter than said verification period, in which case the sensed electrical activity is considered to be noise.

4,559,948

CEREBRAL PALSY TREATMENT APPARATUS AND METHODOLOGY

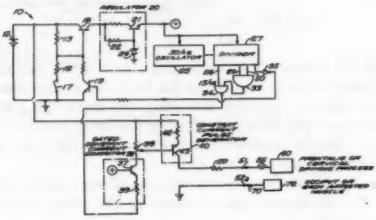
Saul Liss, and Bernard Liss, both of Glen Rock, N.J., assignors to Pain Suppression Labs, Elmwood Park, N.J.

Continuation-in-part of Ser. No. 569,476, Jan. 9, 1984. This application Aug. 7, 1984, Ser. No. 638,502

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 R **5 Claims**



1. A method for suppressing pain and reducing spasticity and other symptoms associated with cerebral palsy including the steps of securing a first electrode at the frontalis muscle, securing a second electrode connected electronically in common to the occiput of the subject's head, and supplying an electrical wave comprising a high frequency amplitude modulation to said first, and said second and third electrodes.

4,559,949

STOOL SAMPLING DEVICE

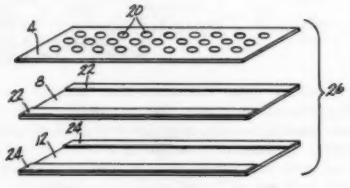
Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437

Division of Ser. No. 266,151, May 22, 1981, Pat. No. 4,420,353, which is a continuation-in-part of Ser. No. 203,083, Nov. 3, 1980, Pat. No. 4,367,750, and a continuation-in-part of Ser. No. 110,437, Jan. 7, 1980, Pat. No. 4,273,741, which is a continuation-in-part of Ser. No. 55,636, Jul. 9, 1979, Pat. No. 4,259,964. This application Aug. 15, 1983, Ser. No. 523,264

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.[4] A61B *10/00*; **G01N** *1/02, 33/52, 33/72*

U.S. Cl. 128—638 **4 Claims**



1. A stool sampling device, comprising:

a first sheet of pliant, impermeable material; an absorbent layer impregnated with a reagent for reacting with any occult blood in a fecal sample, adhesively secured to one side of said first sheet, for receiving a fecal sample;

a second sheet of pliant material adhesively secured in overlying relationship to said absorbent layer and releasable therefrom, said second sheet having a plurality of openings coincident with at least a portion of said absorbent layer for controlling an amount of stool sample which is deposited upon said absorbent layer when said second sheet is wiped over a fecal sample;

said first sheet being provided with at least one fold means so as to aid in forming a closed pouch to effectively isolate a stool sample within said pouch subsequent to removal of said second sheet of pliant material from the device.

4. A method of collecting a stool smear comprising:

wiping the second sheet of the sampling device of claim 1 over an anal area after a bowel movement to deliver a stool sample onto the absorbent layer.

4,559,950

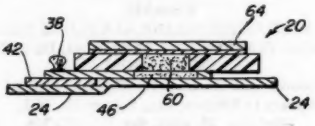
DISPOSABLE BIOMEDICAL AND DIAGNOSTIC ELECTRODE

Raymond C. Vaughan, Hamburg; David M. DiSabito, Clarence; Norbert J. Mruk, Williamsville, and Arthur R. Eddy, Jr., Depew, all of N.Y., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,071

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—641 **19 Claims**



1. A disposable electrode for medical diagnostic and biomedical use, and for clinical use,

said electrode comprising a composite assembly including:

a support sheet connected to and surmounting said assembly,

said support sheet comprising a wafer-like disk having an underside for application of an adhesive thereon,

said disk being formed with a gel storage cavity defining reservoir means for confining a conductive gel therein,

a conductive gel stored in said reservoir means,

band means bridging said gel storage cavity and serving as a bottom closure for said reservoir means,

said band means having an upper surface presented to said support sheet and a lower surface for securement to a patient's body,

adhesive means bonding said upper surface of said band means to said support sheet on said underside thereof,

a conductive adhesive composition constituting a conductive layer coating said lower surface of said band means for adhesively securing said electrode to a patient's body,

said band means including means in electrically conductive communication with said conductive adhesive composition for attachment of an electrical lead line thereto,

port means including passage-defining means formed in said band means for providing fluid-flow communication between said reservoir means and said conductive adhesive composition for releasing said gel from said reservoir means,

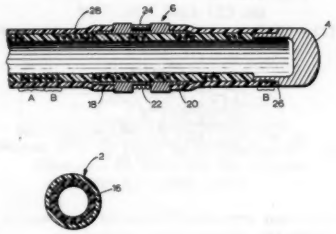
said port means being normally constricted and being selectively actuable to open to release gel from said reservoir means and to provide an enhanced conductive path between said conductive adhesive composition and a body surface to which said electrode is applied.

4,559,951

CATHETER ASSEMBLY

Roger W. Dahl, Anoka, and David W. Mayer, Bloomington, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Nov. 29, 1982, Ser. No. 445,240
Int. Cl.[4] A61B 5/04; A61N 1/05
U.S. Cl. 128—642 4 Claims



1. An intravascular catheter assembly comprising in combination:

(a) a first extruded flexible plastic tube having at least one lumen longitudinally extending therealong, a proximal end and a distal end, said first tube being formed from a plurality of layered, tubular extrusions, wherein each tubularly extruded layer is extruded over a preceding layer;

(b) a plurality of electrical conductors integrally contained within the walls of said first tube, each of said electrical conductors being wound in a continuous helix over one of said layers at a predetermined pitch, before extruding the next successive layer thereover, such that the convolutions of each of said helices are bound in noncontacting relation to one another within the walls of said first tube;

(c) a second flexible plastic tube formed from a plastic material having a high molecular weight relative to the plastic material of said first plastic tube and having an outer diameter which is less than the inner diameter of the lumen of said first flexible plastic tube, said second plastic tube being coaxially disposed within the lumen of said first plastic tube;

(d) at least one further electrical conductor wound as a helix and disposed within the lumen of said second plastic tube and extending longitudinally from said proximal end to said distal end;

(e) means attached to each of said conductors at said proximal end for making electrical connections thereto; and

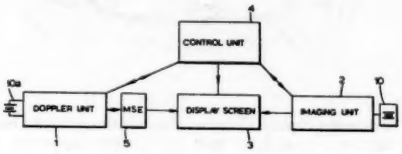
(f) at least two surface electrodes, one of which has edge portions of a lesser thickness than a center portion thereof and said center portion having an annular recess formed within its exterior surface and wherein an outer tubular sheath formed from a plastic material of a high molecular weight relative to the plastic material of said first plastic tube is mounted over said first tube so as to overlie said edge portions of said one of said surface electrodes to thereby contain said one of said surface electrodes to said first tube and expose said exterior surface of said center portion of said one of said surface electrodes, at least one of said plurality of electrical conductors being electrically coupled to said one of said surface electrodes at said recess, the other of said surface electrodes being positioned at said distal end of said first tube and electrically connected to said further electrical conductor.

4,559,952

METHOD OF ULTRASONICALLY MEASURING BLOOD FLOW VELOCITY

Bjorn A. J. Angelsen, and Kjell Kristoffersen, both of Trondheim, Norway, assignors to Vingmed A/S Inkognitogt, Oslo, Norway

Filed Nov. 9, 1982, Ser. No. 440,255
Claims priority, application Norway, Nov. 13, 1981, 813848; Apr. 16, 1982, 821245
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—663 24 Claims



1. A method of ultrasonically measuring the blood flow velocity by combining ultrasonic Doppler blood velocity measurements, either pulsed wave or continuous wave, and pulse echo amplitude imaging by measuring scan lines to enact an imaging sweep for investigating biological systems, the steps comprising,

alternately carrying out said Doppler measurement and said amplitude imaging sweep during sequential time intervals with such rapid alteration that the Doppler measurement and amplitude imaging appear simultaneous to a usser,

providing sufficiently long time intervals for each amplitude imaging sweep for acquiring a plurality of scan lines of an ultrasonic beam over an image field so that the scanning appears instantaneous to the user without any reduction from the image scanning rate for a freestanding imaging instrument,

providing time intervals for either a continuous wave Doppler measurement or for several ultrasonic pulses for pulsed Doppler measurements, the minimum length of each time interval being sufficiently long to obtain a Doppler frequency estimation to generate a substitute signal,

presenting said amplitude imaging together with an indication of the region of Doppler measurement in real time on a display device, the region of Doppler measurement consisting of a small and localized region for pulsed wave measurements or comprising the region of the overlap between transmitting and receiving beams for continuous wave Doppler measurement,

generating a substitute signal with spectral content close to that of the Doppler measurement, said substitute signal being generated from the Doppler measurement after passing through a tissue filter removing strong low frequency components from tissue structures, said substitute signal replacing said Doppler measurement at least when there is no useful Doppler measurement present,

presenting the resulting signal in an output form

providing a close approximation to that of a simultaneous Doppler measurement, either pulsed or continuous wave, and amplitude imaging without any a freestanding Doppler instrument or without any reduction in the beam scanning rate for updating an amplitude image produced solely by a free-standing imaging instrument.

4,559,953

APPARATUS FOR DETECTING CHANGES IN SHAPE OF A BODY

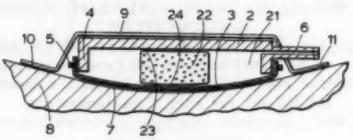
Basil M. Wright, Rickmansworth, and Christopher A. R. Haire, Kenton, both of England, assignors to Pye (Electronic Products) Limited, Cambridge, England

Filed May 8, 1980, Ser. No. 147,971

Claims priority, application United Kingdom, May 11, 1979, 7916457

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—680 **8 Claims**



1. A detector capsule for being attached to a wall of a body, said capsule comprising at least one flexible diaphragm, one said flexible diaphragm engaging and moving complementarily with both concave and convex distensions of said wall, means for pneumatically connecting said capsule to a transducer responsive to variations in volume in said capsule as a result of changes in said wall, and means including resiliently deformable material located within said capsule for constantly urging said one diaphragm into virtually complete engagement with said wall.

4,559,954

ELECTRONIC CLINICAL THERMOMETER

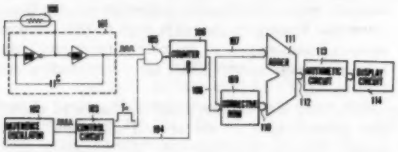
Masakazu Murase, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 454,020

Claims priority, application Japan, Jan. 13, 1982, 57-2808

Int. Cl.⁴ A61B *5/00*

U.S. Cl. 128—736 **12 Claims**



1. An electronic clinical thermometer which comprises:

temperature sensing means for producing an output signal which signal corresponds to a temperature sensed by said temperature sensing means;

corrective data storage means coupled to said temperature sensing means for storing plural items of corrective data which data serves to correct said output signal to enable a temperature measurement of desired accuracy by said temperature sensing means, said storage means being arranged to be addressed by an input signal which is the output signal of said temperature sensing means, said temperature sensing means being operative to produce said output signal as a digital signal having a resolution higher than a predetermined temperature resolution, wherein higher order bits of said digital signal, which bits represent a resolution corresponding to the predetermined temperature resolution, serve as the address input to said corrective data storage means for reading corrective data out of said storage means, the corrective data corresponding to the address input being read out of said storage means; and

adding means coupled to said temperature sensing means and to said corrective data storage means for adding the corrective data read out of said corrective data storage means and the output signal of said temperature sensing means, said output signal being made to approximate a linear output in a predetermined temperature range at an output of said adding means to enable said temperature measurement of desired accuracy.

4,559,955

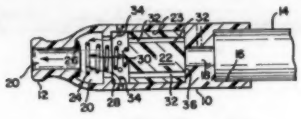
CONTROLLED AIR BLEED CIGARETTE HOLDER

Bert R. Brockway, 3648 N. Pine Grove Ave., Chicago, Ill. 60613, and Stephen R. Arnold, 2352 Ohio St., Lisle, Ill. 60532

Filed Jun. 20, 1983, Ser. No. 506,007

Int. Cl.⁴ A24F *7/02, 7/04*

U.S. Cl. 131—198.2 **9 Claims**



1. An air bleed apparatus for use in conjunction with a cigarette or the like, said apparatus comprising:

a mouthpiece having an inlet end for communicating with said cigarette or the like and having mouthpiece port means for communicating inspiration vacuum from the smoker's mouth to said inlet end;

air bleed port means for admitting ambient air to said mouthpiece portion means; and

valving means operable between first and second valving conditions for automatically communicating said mouthpiece port means in said first valving condition to said air bleed port means during an initial phase of each inspiration and thereafter during the same inspiration said valving means automatically shifting to said second valving condition so as to communicate said mouthpiece port means substantially only to said inlet end, so that during each initial phase of each inspiration a quantity of ambient air is supplied to the mouth from said air bleed port means, said valving means automatically setting to said first condition before the substantive process of the next inspiration.

4,559,956

METHOD OF AND APPARATUS FOR CURING TOBACCO

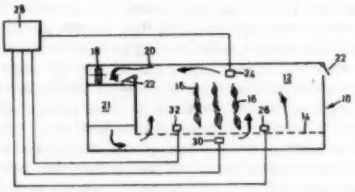
Jan H. De Lange, Hartebeesfrontein, and Ernest Fick, Durban, both of South Africa, assignors to Modsa (Proprietary) Limited, Transvaal, South Africa

Filed Feb. 28, 1983, Ser. No. 470,032

Claims priority, application South Africa, Mar. 29, 1982, 82/2108

Int. Cl.⁴ A24B *3/12, 3/04, 1/02, 3/02*

U.S. Cl. 131—303 **5 Claims**



1. A method of curing tobacco leaf located in a curer which includes the steps of circulating an air stream through the curer, supplying heat to the air stream, controlling the heated air stream so as to maintain a first substantially constant tem-

perature in the curer for a predetermined period, during the predetermined period reducing the relative humidity level prevailing in the curer from a first level to a second level, and, after the predetermined period, controlling the heated air stream so as to maintain a predetermined temperature differential between upper and lower zones in the curer.

4,559,957

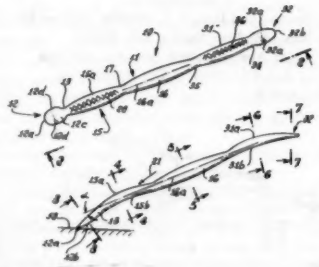
CUTICLE PUSHER

Yosh Hokama, 2126 W. 236th St., Torrance, Calif. 90501

Filed Jan. 23, 1984, Ser. No. 572,894

Int. Cl.⁴ A45D *29/00*

U.S. Cl. 132—73 **9 Claims**



1. In a cuticle pusher, the combination comprising:

(a) an elongated stem and a cuticle pusher blade at one end of the stem, and a rearwardly tapering nail cleaning tip at the opposite end of the stem, the blade having an edge facing forwardly and downwardly, and the blade having a downwardly facing side,

(b) the stem having, along its length away from the blade, an upwardly arching first section, a substantially straight and longitudinally extending second section merging at a first zone with said first section, and an upwardly arching third section merging with said tip and also merging with said second section at a second zone,

(c) said first section having an upper side which is convex lengthwise of said section and an underside which is concave lengthwise of said section, and substantially flat, laterally, said upper and under sides angled to conform to the end portions of the user's index and middle fingers, respectively, in both flexed and unflexed conditions of such fingers,

(d) and said third section also having an upper side which is convex lengthwise of said section, and an underside which is concave lengthwise of the stem and is substantially flat, laterally, said third section upper and under sides angled to conform to the end portions of the user's index and middle fingers, respectively, in both flexed and unflexed conditions of such fingers,

(e) said first and second zones having cross sections which are reduced relative to the maximum cross sections of said first, second and third sections,

(f) said first and third sections being substantially elliptical in cross section.

4,559,958

APPARATUS FOR STORING FLAT AND PREFERABLY CIRCULAR OBJECTS

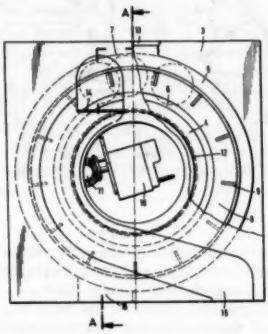
Franz Wingerter, Berlin, Fed. Rep. of Germany, assignor to Heinrich H. Klussendorf GmbH & Co. KG, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,098

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318124

Int. Cl.⁴ G07D *9/04*

U.S. Cl. 133—4 A **7 Claims**



1. An apparatus for storing flat and in particular circular objects, especially coins, with slot-shaped openings for inserting and dispensing the objects, as well as for removing the overflow, in which the objects are arranged within circular compartments rotatable about a concentric axis, whereby the compartments have limiting surfaces in the direction of this axis and which pass helically about the concentric axis so that the plane of the stored objects is perpendicular to the concentric axis, around which the compartments are rotated, and so that a plurality of successive compartments are formed in the axial direction, the openings for insertion and dispensing are in one plane perpendicular to the axis on one side of the helical arrangement of the limiting surfaces and the opening for the overflow is located in a plane parallel thereto on the other side of the helical arrangement of the limiting surfaces, whereby compartments are made ready for the objects to be inserted by moving the compartments in one rotation direction and are made ready for dispensing the stored objects by moving the compartments in the other rotation direction.

4,559,959

DISHWASHING APPARATUS

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Oct. 18, 1982, Ser. No. 434,980

Int. Cl.⁴ B08B *3/02, 7/04*

U.S. Cl. 134—56 D **17 Claims**

1. In a multiple-fill dishwasher including a wash chamber having, a sump at the bottom thereof,

means including a remotely controlled inlet valve for supplying cleansing liquid into said sump,

means for draining liquid and entrained soil from said sump,

a recirculating pump having an intake adjacent the bottom of said sump and a spraying system receiving the output of said pump for spraying cleansing liquid onto soiled ware contained within said chamber,

control means connected to control said valve, said drain means, and said pump to perform a selected one of a plurality of different cleansing cycles which are automatically selected according to the extent of soil on the ware to be washed,

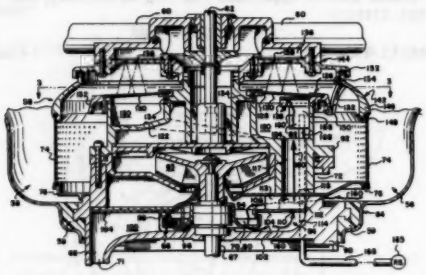
and an operator-actuated switch means for commencing operating of the control means,

the improvement comprising:

a sensor means responsive to a predetermined or greater particulate soil concentration in the cleansing liquid during liquid recirculation,

means operated by said sensor means during liquid recirculation in response to said predetermined or greater soil concentration to cause said control means to select a cycle designed to wash heavily soiled ware,

and means operated by said sensor means in response to less than said predetermined soil concentration at a predetermined time in an early part of the dishwasher's operation to select a cleansing cycle designed to wash lightly soiled ware.



4,559,960

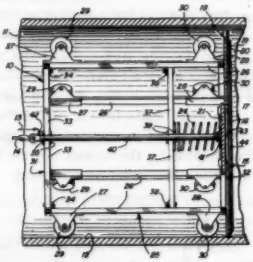
SEWER CLEANER APPARATUS

William D. Lanier, Albany, Ga., assignor to City of Albany, Georgia, Albany, Ga.

Filed Oct. 20, 1983, Ser. No. 543,979

Int. Cl.[4] B08B *9/04*

U.S. Cl. 134—166 C **4 Claims**



1. Apparatus for cleaning a sewer pipe or the like positioned generally horizontally for flow of liquid sewage therethrough, comprising: a support structure arranged to be disposed in the pipe, and flow directing means supported by said support structure and arranged to so direct liquid normally flowing in the sewer pipe as to hydraulically agitate and release debris and cause the debris to be carried by the liquid in a downstream direction, said flow directing means comprising means of annular form defining blocking means to substantially block flow in the lower part of the pipe and to define an opening for directing flow from an elevated region in proximity to a central longitudinal axis of the pipe, a flow control member movable between a first position in which said opening is open and a second position in which said opening is partially closed and of restricted area for obtaining in said second position a liquid stream having a smaller cross-sectional area and a larger horizontal velocity component, spring means acting to normally place said flow control member in said second position, cable means connected to said flow control member for acting against said spring means and moving said flow control member from said second position to said first position and to obtain a liquid stream having a larger cross-sectional area and mass per unit length and a smaller horizontal velocity component to fall more directly downwardly on debris on the downstream side of the apparatus, said cable means being also operative as a tether for moving said apparatus in an upstream direction, said apparatus being operable with said control member in said second position to be moved longitudinally in the pipe by liquid sewage normally carried by the pipe and to advance in a downstream direction behind debris agitated by the liquid stream which flows through said partially closed opening, and said apparatus being operable upon movement of said control member to said first position to allow liquid to drop with a flushing action from the upstream side of said apparatus and through said elevated region of said opening onto debris on the immediate downstream side of the apparatus.

4,559,961

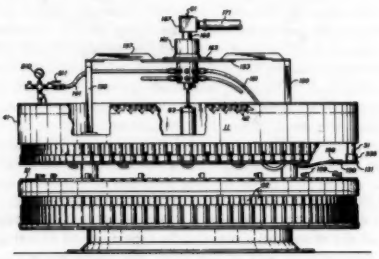
SANITIZER SYSTEM FOR BEVERAGE CAN FILLER MACHINE

Frank E. Anderson, and Robert A. Martin, both of 501 S. Phoenix, P.O. Box 145, Fort Smith, Ark. 72902

Filed Apr. 16, 1984, Ser. No. 600,766

Int. Cl.[4] B08B *9/00;* **B65B** *3/04*

U.S. Cl. 134—166 R **13 Claims**



1. A sanitizer system for a beverage can filler machine having a rotating bowl and associated circular array of filler valves with internally tapered cylindrical centering bells, a reservoir and a rotating conveyor comprising

a plurality of collector manifolds, each having a chamber with an outlet opening and at least three upward cylindrical projections with peripheral sealing means adapted to seal against the internal taper of the centering bells of filler machine valves, said projections' interiors communicating with said chamber and being in an arcuate arrangement with a radius corresponding to that of a filler machine valve array,

means for holding each said manifold in a raised position off said rotating conveyor to cause all of its projections to seat and seal against corresponding centering bells of said can filler machine and to receive liquid flow from said valves when open,

a plurality of flexible hoses, each connectable at one end to one of the outlet openings of said manifolds,

a stationary return pipe connected to said reservoir,

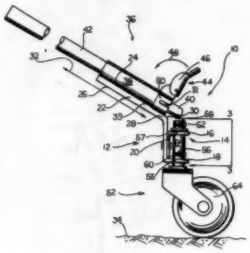
a rotating collector located above said bowl and having a plurality of inlets with said hoses connected thereto and a rotatable, liquid-tight connection with said return pipe,

whereby a liquid return path is provided from said manifolds through said rotatable liquid-tight connection to said stationary return pipe to a reservoir.

4,559,962
AUXILIARY MOBILITY GUIDE FOR A CANE

John Marchiano, 23 Spring St., Tremont, Pa. 17981

Filed Jan. 23, 1985, Ser. No. 694,030
Int. Cl.[4] A61H 3/02; B60B 33/00
U.S. Cl. 135—85 6 Claims



1. An auxiliary mobility guide adapted to be mounted on a cane for sightloss persons comprising:

(a) a frame including at least one C-shaped bracket, said bracket having an upper horizontal leg and a lower horizontal leg connected by a vertical leg, an arm including an upper and lower side, said arm attached at its one end to the top of said vertical leg, said arm projecting upwardly sloping away from said upper horizontal leg, thereby forming an inclined plane approximately equal to that plane at which sightloss users place a guide cane with respect to the ground;

(b) a bracket mounted on said arm's upper side adapted to adjustably overfit the tip end of said cane;

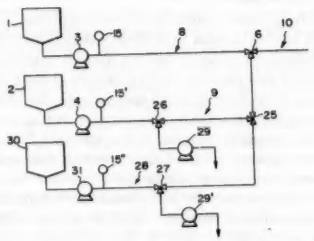
(c) one freely swiveling, rollable wheel assembly for each said C bracket, said assembly adapted to be received by and retained within each of said frame's C brackets, said assembly's wheel fitting freely below said frame's lower horizontal leg,

whereby when said mobility guide is mounted on said tip end of said cane, said swiveling and rolling of said wheel upon the ground surface as the user walks using said guide will send tactile responses through said guide to said cane and to the hand of said cane's user at the same cane-to-ground angle as when said cane is used alone.

4,559,963
SYSTEM FOR FEEDING LIQUID SUBSTANCES

Ko Sugisawa; Kazuya Sekiguchi; Masao Taguchi; Masayuki Nakatani, and Hitoshi Iwata, all of Higashiosaka, Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed May 1, 1984, Ser. No. 605,878
Claims priority, application Japan, May 2, 1983, 58-78756
Int. Cl.[4] E03B 5/00
U.S. Cl. 137—1 3 Claims



1. A liquid substance feed system capable of sequentially feeding two or more kinds of liquid substances having different properties to a single transport pipe at a predetermined pressure and flow rate, said system comprising:

at least two liquid substance feed means each including a supply device from which a liquid substance is fed to a process apparatus, a respective transport pipe in communication with each respective supply device, and a respective delivery pump provided in said transport pipe downstream of each said supply device for the delivery of the liquid substance into a downstream transport pipe and capable of controlling the flow rate of the liquid substance;

a third transport pipe connected through a first valve to said respective pipes;

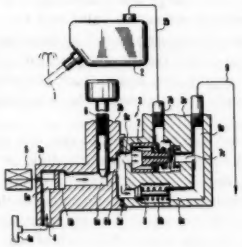
a diverged piping, provided between said delivery pumps and said first valve through another valve in one of said at least two liquid substance feed means, for discharging the liquid substance; and

a back pressure device provided in said diverged piping and adapted to discharge the liquid substance while maintaining the liquid substance at a predetermined pressure.

4,559,964
VALVE UNIT FOR A WASHING DEVICE OF PRIVATE PARTS OF HUMAN BODY

Yuji Yamaguchi, and Shinji Kawai, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 6, 1984, Ser. No. 647,634
Claims priority, application Japan, Sep. 27, 1983, 58-149469[U]; Sep. 29, 1983, 58-150860[U]
Int. Cl.[4] A47K 7/00
U.S. Cl. 137—107 4 Claims



1. A water flow control valve unit for a washing device of the private parts of a human body, which provides a washing nozzle movable forward and backward by the pressure of water, comprising;

first portion connected to the water supplying source and having an opening-closing valve,

second portion connected to said first portion and having a water quantity regulating valve,

third portion connected to said second portion and having a changeover valve, a relief valve and a drain port,

said third portion being further connected to a drain pipe and a pipe for supplying water to a warm water tank having a washing nozzle,

said changeover valve being so arranged as to send water to the pipe for supplying water to the warm water tank closing the drain port during the use of the washing device, and after the use of the washing device, to send the returning water from the warm water tank to the drain pipe opening the drain port,

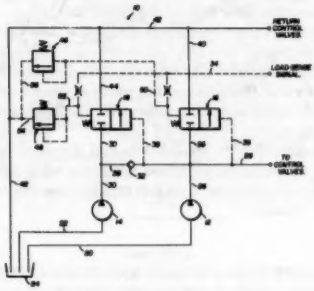
said relief valve being so arranged to release the excessive water pressure between the water quantity regulating valve and the changeover valve, and

said first portion, second portion and third portion being constituted as a single unit.

4,559,965
MULTIPLE COMPENSATING UNLOADING VALVE CIRCUIT

Roger D. Mickelson, West Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 9, 1984, Ser. No. 569,416
Int. Cl.[4] F15B *13/09*
U.S. Cl. 137—115 1 Claim



1. A hydraulic circuit comprising:

a primary fixed displacement pump and a secondary fixed displacement pump with said pumps being connected to a reservoir for receiving hydraulic fluid, said primary pump having a discharge line connected to a first closed center compensator unloading valve and to a main supply line, said secondary pump having a discharge line connected to a second closed center compensator unloading valve and to said supply line, and a check valve being connected in said supply line at a location between said pump discharge lines;

a load-sense line connected to one end of each of said unloading valves for transmitting fluid pressure against one end of each of said unloading valves, a pilot line connected between the opposite end of each of said unloading valves and said supply line for transmitting fluid pressure against the opposite end of each of said unloading valves, said pilot lines being connected to said supply line downstream of said check valve, each of said unloading valves being spring biased at said one end toward a normally closed position, the fluid pressure in said load line adding to the spring bias force applied to each unloading valve, and each of said unloading valves being moved to an open position when the pressure in a pilot line exceeds the combined load line pressure and spring bias force, and the unloading valves being connected to said reservoir by a return line for venting the output of either pump to said reservoir when its unloading valve is in an open position; and

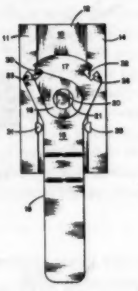
the spring bias force for the primary pump unloading valve being substantially greater than the spring bias force for the secondary pump unloading valve for permitting phasing of the unloading valves such that the primary pump supplies all of the fluid demand for the circuit until the fluid demand exceeds the capacity of the primary pump at which time the secondary pump adds flow to supply larger fluid demands; and

a first relief valve connected between said primary pump unloading valve and said return line and a second relief valve connected between said secondary pump unloading valve and said return line, and said first relief valve having a substantially greater relief setting than said second relief valve.

4,559,966
VALVE HANDLE WITH SELECTABLE STOPS

Roger G. Massey, Exeter, and David G. Holloway, Concord, both of N.H., assignors to The Parker & Harper Manufacturing Company, Worcester, Mass.

Filed Feb. 15, 1985, Ser. No. 702,341
Int. Cl.[4] F16K *31/60*
U.S. Cl. 137—270 5 Claims



1. In a fluid control valve having a valve body, a rotatable valve element that opens and closes a fluid passage through the body by substantially 90° rotation, detent locations for determining limit positions of rotation and a handle assembly for rotating said element, the combination in said handle assembly comprising:

(a) a manually rotatable arm having a first aperture for receiving a stem shaft of said valve element and having at least two notches at spaced locations in an arc at a predetermined radius from said first aperture; and,

(b) a detenting device having a second aperture for receiving said stem shaft together with said arm and having a detent dog positionable through a selected one of said notches to coact with said detent stop locations so as to define rotational movement limits of said handle, whereby the rotational limit positions of said handle can be changed by changing the notch through which said dog is positioned.

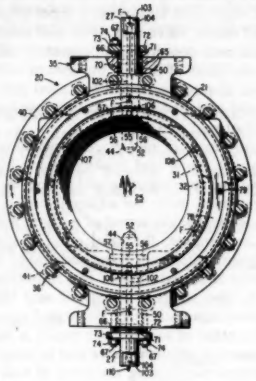
4,559,967
VALVE AND METHOD OF MAKING SAME

John F. Gardner, Loveland, and Thomas W. Showalter, Milford, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Mar. 9, 1983, Ser. No. 473,555
Int. Cl.[4] F16K *49/00*
U.S. Cl. 137—340 17 Claims

1. In a fluid control butterfly valve comprising, a valve body structure having a main fluid flow passage therethrough and first substantially annular sealing surface means around the periphery of said passage, and a rotatable closure structure for controlling fluid flow through said passage, said closure structure having second substantially annular sealing surface means around its periphery adapted to engage said first sealing surface means to shut off fluid flow through said valve, the improvement comprising substantially annular heat exchange means carried entirely by said closure structure and comprising a substantially annular conduit means corresponding roughly in size and outline to the peripheral cross-sectional outline of said flow passage, said annular heat exchange means operating independently of said valve body structure, said annular conduit means corresponding in outline to and being

disposed immediately adjacent yet in radially inwardly spaced relation with respect to said second sealing surface means, said



annular heat exchange means serving to control the temperature of at least said second sealing surface means.

4,559,968

PRESSURE CONTROL VALVE

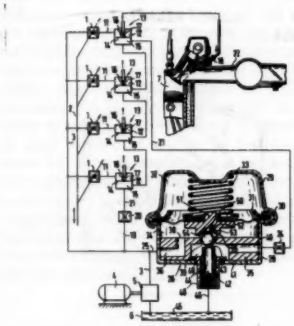
Willi Strohl, Schwieberdingen, and Gerhard Jauch, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 426,345, Sep. 29, 1982, abandoned. This application Sep. 19, 1984, Ser. No. 652,165

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218914

Int. Cl.[4] F16K *31/165*

U.S. Cl. 137—510 **12 Claims**



1. A pressure control valve in a fluid pressure system, said pressure control valve including a fluid pressure medium chamber and a spring chamber separated by a membrane, said pressure medium chamber having at least one inlet opening and an outlet opening for the fluid medium to be controlled, a valve spring in said spring chamber which stresses the membrane in a direction toward closing of the pressure control valve, a valve, a valve member floatingly disposed on said membrane via a ball-shaped support member, a variable throttle spacing formed between the surface of said valve member and said outlet opening, a valve seat upon which said valve member seats, said outlet opening in said fluid pressure medium chamber being disposed upstream of the valve seat and at a distance from said valve seat, said valve member is displaced into an open position upstream of said outlet opening in order to control a fluid medium return flow through said valve seat in cooperation with said outlet opening during exertion of a fuel medium pressure on said membrane corresponding to a pressure above the pressure to be controlled, while said valve member descends into said outlet opening with a throttling action to a greater or lesser degree relative to said outlet opening during a medium pressure below the pressure to be controlled, and said valve member seats on said valve seat during a predetermined lower medium pressure to prevent fuel medium flow from said pressure medium chamber.

4,559,969

SAFETY DEVICE FOR VENTING EXCESS PRESSURE IN WET CAPACITOR CONTAINERS

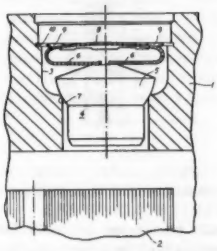
Lennart E. Ulming, Röttle, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 21, 1984, Ser. No. 653,608

Claims priority, application Sweden, Oct. 12, 1983, 8305609

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—540 **4 Claims**



1. A safety device for venting excess pressure in a wet capacitor container (1), including a lift valve (4) with a valve body (5) and a valve seat (7), said valve in an open position being intended to connect the interior of the container with the surrounding atmosphere, the valve body (5) being disposed for being pressed against the valve seat (5) with the aid of spring bias against the action of the pressure prevailing in the container (1), characterized in that the safety device includes a resilient means of sheet metal, which is formed as a washer-like holding spring (8), which by engagement with the wall at the mouth of the container (1) is retained in this wall, and also has at least one projection (6) originally extending ouside the periphery of the holding spring (8) but bent over in a direction towards the central point thereof to form a tongue resiliently engaging against the body (5).

4,559,970

PILOT CONTROL RELAY VALVE APPARATUS

Donald K. Taylor, Lafayette, La.; William Rogers, Ocean Springs, Miss.; Vernon McGary, Ocean Springs, Miss., and Peter Lenart, Ocean Springs, Miss., assignors to C.S.E. Automation Engineering Services, Inc., Lafayette, La.

Continuation of Ser. No. 315,258, Oct. 26, 1981, Pat. No. 4,442,860. This application Nov. 16, 1983, Ser. No. 552,322

Int. Cl.[4] F16K *17/00*

U.S. Cl. 137—557 **1 Claim**

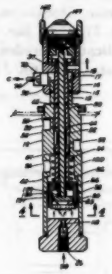
1. A pilot operated relay control valve apparatus comprising:

a. a first elongated housing having a bore extending longitudinally thereof;

b. a second elongated housing having a bore coaxially aligned with the bore of said first housing;

c. a slide valve mounted within said coaxial bores for longitudinal movement, said slide valve having a first piston on one end thereof mounted within an enlarged diameter portion of the bore of said first housing;

d. means for continuously urging said first piston of said slide valve inwardly to a seated position of the first piston;
e. port means in fluid communication with said bore of said first housing and exposing the outer face of said first piston to fluid pressure;
f. a detent means mounted in said second housing and in engagement with said first housing for securing said slide valve in an up position when said slide valve is moved against the bias of said means for urging said first piston inwardly to a seated position;
g. means for urging said detent out of engagement with said first housing when the outer face of said first piston is



exposed to a predetermined high pressure from said port means;
h. a raised annular portion on the outer face of said first piston in alignment with said port means;
i. a resilient annular seal between said port means and said raised annular portion on the outer face of said first piston exposing a relatively small surface area of said first piston to fluid pressure from said port means when said piston is in a seated position, said annular seal permitting the entire outer face of said first piston to be exposed to fluid pressure from said port means when said first piston is out of the seated position.

4,559,971

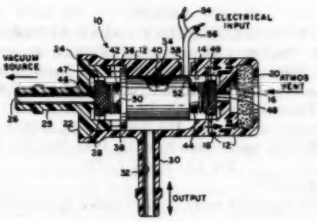
SINGLE COIL VACUUM/VENT VALVE

Cyril E. Bradshaw, Wheaton, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 468,246, Feb. 22, 1983, abandoned. This application Jan. 25, 1985, Ser. No. 694,909

Int. Cl.⁴ F15B *13/044*

U.S. Cl. 137—596.17 **5 Claims**



1. An electromechanical fluid pressure signal control valve comprising:
(a) housing means defining there within a fluid valving chamber having a fluid flow inlet port, an outlet port and a fluid signal port communicating therewith, said housing means including means defining a valve seat about each of said inlet and outlet port;
(b) electrical coil means, said coil means having a stationary ferromagnetic core;
(c) inlet poppet means disposed for movement with respect to said inlet valve seat and outlet poppet means disposed adjacent said outlet valve seat, with said inlet and outlet poppet means each comprising a permanent magnet polarized in the direction of poppet movement with said inlet poppet means disposed adjacent one axial end of said coil means and said outlet poppet means disposed adjacent the opposite end of said coil means;
(d) means biasing each of said poppet means toward their respective valve seats, said biasing means comprising a spring having one end engaging said poppet means and the other end received over the adjacent end of said core, wherein upon electrical current of a given polarity flowing in said coil means, the axial ends of said core are magnetically oppositely polarized and one of said inlet or outlet poppets is seated against the respective adjacent valve seat by the summed forces of said bias plus the magnetomotive repulsion force generated by said current flow, and the other of said poppet means is moved away from the respective adjacent valve seat by magnetomotive attraction forces overcoming the force of said bias means and is magnetically latched to said core so long as said current flows and upon cessation of said current flow said moved poppet means is unlatched and reseated against said valve seat by said bias means; and,
(e) electrical lead means received through the wall of said chamber and adapted for connection of said coil to an external source of electrical power.

4,559,972

VALVE FOR USE IN GASIFICATION REACTOR

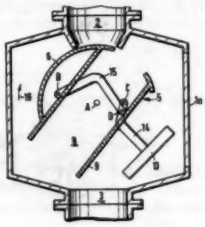
Heinz Wolf, Bad Nauheim, and Werner Emmel, Nidda, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,335

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215730

Int. Cl.⁴ F16K *3/00*

U.S. Cl. 137—614.11 **1 Claim**



1. In a valve comprising a rotary valve member and a valve disc accommodated in a housing having an inlet port and an outlet port and serving to interrupt the passage of material which can trickle or flow, said rotary valve member closing said inlet port before said valve disc closes the outlet port, said rotary valve member having a closing surface for closing said inlet port, said rotary valve member also having an inlet passage and a tube having a guide passage, the inside width of said guide passage being smaller that the inside width of said outlet port, said valve disc serving to fit on a valve seat of said outlet port, said valve disc having a valve arm pivotally fastened at the outside of said tube on a pivot C, a link having one end B pivotally fastened at said housing outside of said tube, the other end D of said link being pivotally fastened at said valve arm, said rotary valve member being pivoted on a horizontal pivot A, the distance between B and D of said link being larger than the distance between A and C and the angle including line BA

and line AC exceeding 90° in the open position of said rotary valve, in the final phase of the movement of said valve disc of its position closing said outlet port said valve disc being moved in vertical direction to said valve seat, whereby the valve disc moves both rotationally and vertically to open and close said outlet port.

4,559,973

WATER IMPERVIOUS HEAT SHRINKABLE TUBE

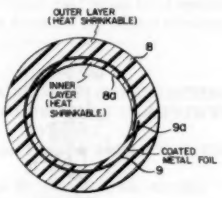
Yoshinari Hane, Isehara; Hiroshi Suzuki, Kanagawa; Tadayuki Uematsu, Chiba; Shigeru Matsumoto; Tetuo Momma, both of Yokohama; Akihiko Kamiya, Kawasaki, and Mitugu Saito, Zushi, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 493,785, May 12, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,088

Claims priority, application Japan, Nov. 26, 1982, 57-177753[U]

Int. Cl.⁴ H01R *4/70*

U.S. Cl. 138—138 **25 Claims**



1. A water impervious heat recoverable rubber or plastic tube comprising:

an inner and outer layer forming a tube, each layer having a thickness in the radial direction of the tube and each layer comprising a heat shrinkable plastic or rubber;

a laminated metal foil layer interposed between said inner and outer layers, the thickness of said inner layer being less than the thickness of the outer layer over the complete extent of the portion of the tube containing said laminated foil layer, said laminated metal foil layer having two longitudinal edges and comprising a metal foil film having a thickness of 0.01 mm to 0.1 mm and, an electrically insulating or semiconducting rubber or plastic sheet laminated on each surface of said metal foil film, said laminated metal foil layer extending up to the entire length of said tube and extending within said tube over more than 360° in the circumferential direction of said tube, the complete longitudinal extent of the two longitudinal edges of said laminated metal foil layer overlapping each other in said circumferential direction over a predetermined distance in said circumferential direction.

4,559,974

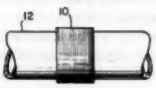
APPARATUS AND METHOD OF ARRESTING DUCTILE FRACTURE PROPAGATION

Norman C. Fawley, 255 Rafael Walk, Long Beach, Calif. 90803

Continuation of Ser. No. 432,321, Oct. 1, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 633,684

Int. Cl.⁴ F16L *9/14*

U.S. Cl. 138—172 **34 Claims**



1. In a crack arrestor for arresting a propagating ductile fracture in a pipe containing fluid under a pressure sufficient to subject the pipe to the possibility of a ductile fracture propagating at a high speed in a predetermined direction, wherein the crack arrestor comprises means for stopping the propagating ductile fracture, and the stopping means includes a band for encompassing and constraining said pipe, the improvement comprising:

the band including a plurality of substantially unidirectional continuous, high tensile strength, non-corrodible, lightweight nonmetallic fibers encapsulated in a resin matrix, the fibers defining with the resin matrix a fluid impervious mass.

4,559,975

HIGH TENACITY POLYESTER FILAMENT FABRIC

Raymond M. Stits, P.O. Box 3084, Riverside, Calif. 92519

Filed Feb. 18, 1982, Ser. No. 350,080

Int. Cl.⁴ D03D *15/00*

U.S. Cl. 139—420 R **4 Claims**

1. A balanced weave greige fabric formed from high tenacity polyester filaments particularly suitable for use as an aircarft cover fabric, said filaments being of from about 40- to about 150- denier size and said fabric having a thread count from about 70 to about 100 threads per inch, warp and filling, and a weight no greater than about 3 ounces per square yard.

4,559,976

METHOD OF PREVENTING A DEFECTIVE WEFT YARN FROM BEING WOVEN IN A FABRIC IN A SHUTTLELESS LOOM

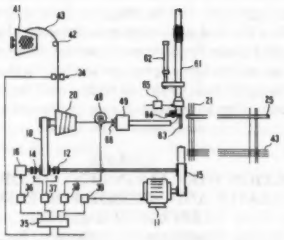
Hidejiro Araki, Toyoake, and Ikuo Kodama, Toyota, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 20, 1983, Ser. No. 533,875

Claims priority, application Japan, Oct. 2, 1982, 57-172535

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **9 Claims**



1. A method of preventing a weft yarn containing therein any defective portion from being woven into a fabric in a shuttleless loom in which consecutive lengths of weft yarn are measured as the yarn is drawn from a supply thereof and each measured length of weft yarn is inserted into the shed of warp yarns under the effect of a fluid ejected from a jet nozzle, said method comprising the steps of monitoring the drawn weft yarn by a sensor which is provided at a point between said weft yarn supply and the location where said weft yarn lengths are measured and within the path along which the weft yarn normally passes, interrupting the weaving operation of the loom in response to a yarn-defect signal which is provided by the sensor while continuing to draw said weft yarn from said supply and continuing to monitor the drawn weft yarn, removing the weft yarn having the defective portion for disposal thereof prior to the point of insertion into said shed, and restarting said weaving operation when said yarn-defect signal is terminated.

4,559,977

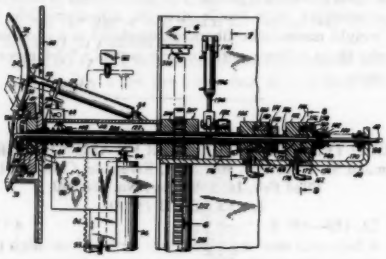
TWIST TYING MACHINE

Gerald G. Dilley, Portland, Oreg., assignor to Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Oct. 27, 1983, Ser. No. 545,993

Int. Cl.⁴ B21F *9/02*

U.S. Cl. 140—93.6 **24 Claims**



1. A head assembly for use in twisting together the ends of a tie ribbon encircling an article which is positioned adjacent thereto for tying, the head assembly comprising:

first and second gripper means adjacent to a position at which an article is to be placed for tying, the first gripper means movable relative to the second gripper means so as to be spaced apart therefrom in a first state and drawn thereto in a second state to clamp one end of a tie ribbon therebetween;

twister head means adjacent to the second gripper means, the second gripper means movable relative to the twister head means so as to be spaced apart therefrom in a first state and drawn thereto in a second state to clamp the other end of the tie ribbon therebetween;

means coupled to the first and the second gripper means for successively positioning the first gripper means and the second gripper means in their second states; and

means coupled to at least one of the first gripper means, the second gripper means, and the twister head means for rotating the first gripper means, the second gripper means, and the twister head means in unison about a common axis so that, when the gripper means are in the second state, the clamped ends of the tie ribbon will be twisted relative to each other to tighten the tie ribbon on the article.

4,559,978

CONNECTION WIRE ALIGNMENT OR ORIENTATION APPARATUS AND METHOD FOR ELECTRICAL CIRCUIT ELEMENTS

Werner Glatzel, Schellerten Ot Ottbergen, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,939

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311792

Int. Cl.⁴ B21F *1/02*

U.S. Cl. 140—147 **6 Claims**

1. An automatic alignment apparatus for straightening a projecting lead (**15**) of an electrical component (**11**), comprising

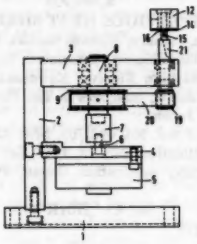
a base plate (**1**), vertical wall (**2**), and bearing plate (**3**) secured in fixed relationship to one another;

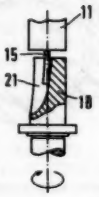
means (**12**) supported by said bearing plate (**3**) for holding said component in fixed relationship to said apparatus, with the component's leads projecting,

at least one rotatable alignment body (**18**) supported by said bearing plate (**3**), said body (**18**) having an axis of rotation (**17'**), a longitudinal outer surface and a front end disposed proximately to said component, and an axial inner groove (**21**);

said alignment body (**18**) being supported in said apparatus along a desired alignment axis (**17**) of one said lead,

means (**10,13,22**) supported by said bearing plate (**3**) for reciprocating one of said component (**11**) and said alignment body (**18**), toward and away from the other, to cause said lead (**15**) to penetrate and engage said axial groove (**21**) of said alignment body, and





means (**5,6,7,19,20**) movably secured to said bearing plate (**3**) for rotating said alignment body while said lead is engaged therewithin;

wherein said axial groove of said alignment body is defined by an inner surface of said body, which surface diverges, at least at said front end, from said axis of rotation (**17'**) and crosses said axis of rotation (**17'**) and curves at an increasing angle to said axis of rotation (**17'**) at increasing distances from said component-proximate end.

4,559,979

ULTRASOUND LEVEL DETECTOR

Arthur Koblasz, Cumming, Ga.; James Hollister, Manchester, Conn., and Douglas Alexander, Marietta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 8, 1983, Ser. No. 559,288

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—9 **14 Claims**

14. A method for automatically filling a container having a given level of ice therein with a carbonated beverage which tends to form a head of foam during said filling, comprising the steps of:

transmitting ultrasonic wave energy toward the top of the container and through an opening therein toward the container bottom;

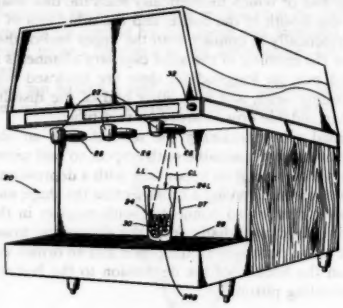
measuring ultrasonic wave energy reflected from said container top, said ice therein and said carbonated beverage for generating container lip signals, an ice level signal and a liquid level signal, respectively;

initiating the flow of said carbonated beverage into said container only in the presence of a lip signal, and an ice signal indicative of a level of ice below a predetermined limit;

stopping the flow of carbonated beverage to said container when the carbonated beverage in said container reaches a predetermined level therein;

reinitiating the flow of said carbonated beverage at a se-

lected time following the stopping of said flow to permit said head of foam to dissipate; and



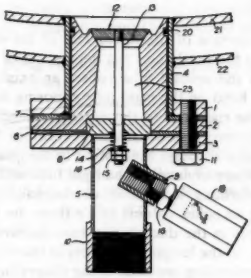
restopping the flow when said liquid level reaches a predetermined distance from the top of said container.

4,559,980

APPARATUS AND A PROCESS FOR INJECTING STEAM DIRECTLY INTO A PRODUCT IN A PROCESSING VESSEL

Glyn R. Giusti, London, England, assignor to T. Giusti & Son Ltd., England

Filed Apr. 20, 1983, Ser. No. 486,803
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—11 **25 Claims**



11. A process for injecting steam directly into a product in a processing vessel comprising:

(A) providing an apparatus which comprises:

(1) a main body fixed to said processing vessel and having a longitudinal bore shaped essentially as a convergent-divergent nozzle, said nozzle having an upper portion having a wall which diverges upwardly and opens into said vessel, and a lower portion which is longer than said upper portion and has a wall which diverges downwardly;

(2) a tubular member extending from said lower portion of said nozzle;

(3) an elliptical member seated in the lower end of said main body partially blocking said bore;

(4) a poppet valve comprising a frustoconical head seated at the upper end of said upper portion of said nozzle, and a valve stem extending through said lower portion of said nozzle and said elliptical member, said poppet valve being normally biased in a closed position;

(5) means for supplying steam at a predetermined pressure through said tubular member; and

(6) air inlet means fixed at an upwardly directed angle in the wall of said tubular member to inject air at a predetermined pressure sufficient to prevent steam hammering in said vessel;

(B) passing steam through said apparatus to the interior of said vessel at a predetermined pressure; and

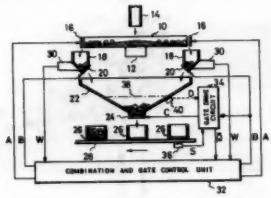
(C) passing air through said air inlet means at a predetermined pressure sufficient to prevent steam hammering in said vessel.

4,559,981

CONTROLLED CHUTE DEVICE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Limited, Japan

Filed May 18, 1983, Ser. No. 495,763
Claims priority, application Japan, May 20, 1982, 57-74676[U]
Int. Cl.[4] G01G *19/22*; B65B *1/34*
U.S. Cl. 141—83 **5 Claims**



1. A controlled chute device, comprising a chute sloped to permit articles to slide down the chute by gravity, loading gate means for delivery of articles to the chute for passage down the chute, a loading gate control circuit adapted for generating successive loading gate control signals, said loading gate means being responsive to said successive control signals for the delivery of successive charges of articles to the chute for passage down the chute, inhibit means operable in response to a loading gate control signal for inhibiting generation of succeeding loading gate control signals by said loading gate control circuit, and release means operable in response to the passage of a charge of articles past a predetermined point in the chute for producing a release signal to stop operation of said inhibit means thereby to allow the next control signal to be generated by said loading gate control circuit for effecting delivery of the next charge of articles from said loading gate means to the chute for passage down the chute.

4,559,982

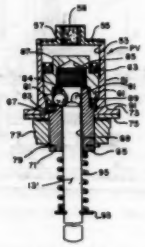
PRESSURE ACTUATED POPPET VALVE FOR FUEL DISPENSING NOZZLE

Arthur C. Fink, Jr., Lonedell, Mo., assignor to Husky Corporation, Pacific, Mo.

Filed Dec. 27, 1983, Ser. No. 565,592
Int. Cl.[4] B65B *1/30*
U.S. Cl. 141—206 **10 Claims**

1. In a fuel dispensing nozzle having a flow path therethrough, said flowpath having an inlet and an outlet formed of the dispensing nozzle, a valve seat within said nozzle constituting a part of said flow path, a normally closed poppet valve cooperable with said valve seat for blocking the flow of fuel through said nozzle by way of said flow path, a spring biasing said poppet valve towards its normally closed position, and means including a stem cooperable with said poppet valve and extending exteriorly of said nozzle for selectively moving said poppet valve from its closed position against the bias of said spring, and into an open flow path position, wherein said improvement comprises, a poppet valve housing constituting, at least in part, said poppet valve, said poppet valve housing having a cylindric bore therein, said poppet valve housing being engagable by said spring and being sealingly engagable

with said valve seat when said poppet valve is in its normally closed position so as to block the flow of fuel through said nozzle by way of its flow path, a piston sealably slidable within said housing cylindric bore between a first and a second position, said stem being received at least in part within said poppet valve housing, said poppet valve housing having coupling means engagable with said stem for coupling said poppet valve housing to said stem for opening of said poppet valve, said coupling means comprising a ball coupling means, said ball coupling means being movable between a coupling position in which said coupling means is in engagement with said stem such that movement of said stem in one direction causes movement of said poppet valve from its closed position towards an open position thereby permitting fuel flow, and an uncoupling position in which said coupling means is clear of said stem thereby to permit movement of said stem in said one direction without effecting opening of said poppet valve for fuel flow,



said piston, when in its first position, positively holding said coupling means in its coupling position, and when in its second position, permitting said coupling means to be moved to its uncoupling position, said poppet valve housing having a port therein communicating between a portion of said flow path upstream of said valve seat and said cylindric bore within said poppet valve housing whereby fluid pressure upstream from said valve seat acts on said piston and forces it towards its first position, a flow restrictor provided in said port to provide restricted flow of fuel into and out of said housing cylindric bore and above said piston, and a piston spring biasing said piston towards its second position so that upon the fluid pressure upstream from said valve seat decreasing below the fluid pressure within said cylindric bore, said piston spring biases said piston towards its second position thereby permitting said coupling means to move from its coupling to its uncoupling position and allowing said poppet valve to close and disabling reopening of the same.

4,559,983

DEVICE FOR PREPARING AND DISPENSING A SOLUTION

Jean-Claude Paoletti, Volvic, France, assignor to Laboratoires Merck Sharp & Dohme Chibret, Paris, France

Filed Dec. 21, 1983, Ser. No. 563,727
Claims priority, application France, Dec. 29, 1982, 82 21991
Int. Cl.⁴ B65B *3/04*; B67C *3/26*
U.S. Cl. 141—260 **1 Claim**

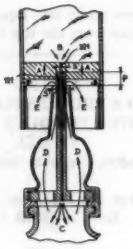
1. A device for preparing and dispensing a solution which comprises:

a bottle containing a solid substance, the bottle having an opening and being adapted to receive a solvent for the solid substance and to contain the solution resulting from dissolution of the solid substance;

a closure for the bottle opening comprising a rigid tube mounted on a disc shaped base exteriorly of the bottle opening, said tube and base having an axial capillary channel extending from the top of the tube to the bottom of the disc shaped base, and longitudinal slots on the surface of the tube starting near the top of the rigid tube, the disc shaped base having orifices extending therethrough;

an elastically deformable, essentially tubular instilling head, one end of which hermetically seals the disk shaped base to the mouth of the bottle, and the other end of which is hermetically in contact with the upper end of the tube so that the opening of the axial capillary channel is not covered but the longitudinal slots are enclosed within the instilling head, and said other end of the distilling head being slidable downwardly on said tube;

a second tube containing the solvent with an obturating piston inwardly slidable with respect to said second tube, the piston having an upper face with a depression therein, the depression having a cross-section the shape and size of the rigid tube and connected with recesses in the upper face extending radially from the depression towards but not to the periphery of the piston and an orifice extending from the bottom of the depression to the bottom of the obturating piston;



whereby insertion of the upper end of the rigid tube connected to the bottle into the depression of the obturating piston of the second tube causes an axial sliding of the instilling head on the rigid tube exposing the longitudinal slots in the rigid rod to the radially extending recesses in the obturating piston causing solvent to flow from the second tube through the orifice in the piston, down the axial capillary channel of the rigid tube and into the bottle thereby forming a solution of the solid substance and expelling an equal volume of air from the bottle through the orifices in the disc shaped base on which the tube is mounted, to the longitudinal slots in the rigid tube, to the radially extending recesses in the obturating piston to the atmosphere;

whereby, after separation of the rigid tube from the obturating piston of the second tube, the solution can be dispensed by radial crushing of the instilling head on the bottle.

4,559,984

FUNNEL

Joseph Wyeech, 28050 Groesbeck, Roseville, Mich. 48066

Filed May 31, 1984, Ser. No. 615,818
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—340 **10 Claims**

1. A funnel for an enclosure having an aperture comprising a funnel body terminating in an elongated spout provided with a longitudinal axis and having a free end adapted for projection into the aperture;

exterior threads located upon and extending along the entire length of said spout from said funnel body to said free end thereof;

a rotatable nut threaded over said spout for longitudinal adjustment thereon between said funnel body and said free end thereof;

said nut having a leading end and a trailing end;

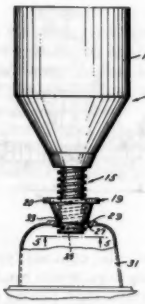
a laterally extending annular flange provided on the trailing

end of said nut to facilitate grasping and rotation of said nut upon said spout;

a tapered conical shoulder depending from said flange and integral with said nut adapted for selective sealing and cooperative registry with the enclosure at its aperture;

a single lug pin carried by said spout and arranged perpendicular to and intersecting the longitudinal axis of said spout;

said lug pin having a pair of flattened ends located on the free end of said spout opposite the leading end of said nut



for preventing the nut from being separated from said spout;

said lug pin also extending transversely outward of said spout positioned within and operatively engaging said enclosure of manual rotation of said nut into operative retaining registry therewith;

said enclosure being compressively engaged between the leading end of said nut and the flattened ends of said lug pin; and

said funnel being rigidly and self-supported when mounted upon the enclosure.

4,559,985

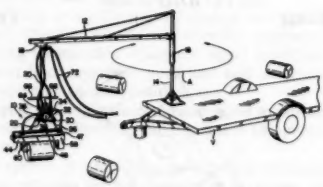
BOOM SUSPENDED WOOD SPLITTER

Jim May, 12110 SE. Pine St., Portland, Oreg. 97216

Filed May 10, 1984, Ser. No. 608,813

Int. Cl.⁴ B27L *7/00*

U.S. Cl. 144—193 A **5 Claims**



1. A wood splitting apparatus comprising

upright support means,

a horizontal boom mounted on said support means for spaced relation for the ground,

a movable member supported on said boom for adjustment along said boom,

a frame member,

a flexible line suspended from said movable member,

a winch drum journaled on said frame member connected to said flexible line for providing suspended support of said frame member on said line,

said winch drum being operative to raise and lower said frame member,

wood splitting means on said frame member whereby upon vertical adjustment of said frame member and upon positioning said wood splitting means along the boom over a log, said wood splitting means is capable of splitting logs within the area covered by said boom, and

handle means on said frame arranged to be grasped by the operator for manipulating the frame and wood splitting means over a log.

4,559,986

BARKING DRUM WITH AT LEAST ONE BEARING RING

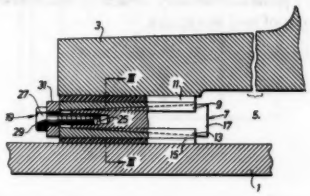
Sven A. Svensson, Själevad; Bo J. M. Oledal, Frösön, and Stig-Gunnar E. Löfgren, Järved, all of Sweden, assignors to KMW Aktiebolag, Karlstad, Sweden

Filed Jul. 10, 1984, Ser. No. 629,267

Claims priority, application Sweden, Jul. 11, 1983, 8303923

Int. Cl.⁴ B27L *1/00*

U.S. Cl. 144—208 B **12 Claims**



11. A barking drum comprising a substantially cylindrical drum shell oriented with its longitudinal axis extending generally horizontally, at least one bearing ring surrounding said drum shell and forming an interjacent gap with the shell, and a plurality of fastening means fitted in the gap and spaced at substantially equal distances around the circumference of the shell for clamping the bearing ring to the drum shell, at least a plurality of said fastening means comprising clamps including a first metal plate having a layer of set-resistant rubber of maximum thickness of 10 mm on one face thereof oriented for bearing against said ring, a second metal plate having a layer of set-resistant rubber of maximum thickness of 10 mm on one face thereof oriented for bearing against said drum shell, a metal wedge located between and supporting said first and second metal plates, the longitudinal dimension of said wedge corresponding to the longitudinal axis of said drum shell and the thickness of said wedge diminishing in the longitudinal dimension, and screw means threadably engaging said wedge and cooperating therewith for displacing the wedge in its longitudinal dimension between said plates for thereby expanding the clamp in a radial direction relative to said shell to thereby substantially rigidly clamp the drum shell in a desired position in the bearing ring.

4,559,987

VENEER LATHE

Jacques Fondronnier, Creteil; Jean Guillerm, Nevez, and Michel Comte, Ermont, all of France, assignors to Centre Technique du Bois et de L'Ameublement, Paris, France

Filed May 7, 1984, Ser. No. 607,627

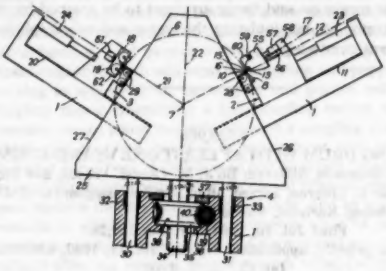
Claims priority, application France, May 9, 1983, 83 07689

Int. Cl.⁴ B27L *5/02*

U.S. Cl. 144—213 **7 Claims**

1. An improved veneer lathe comprising a cutting slide and an anti-buckling device pressed by actuating means against a workpiece secured between jaws of rotating end chunks, said cutting slide and said anti-buckling device being guided in a crosswise motion relative to the lathe's stationary frame along convergent planes forming between them an upwardly-open-

ing obtuse angle of substantially 120°, wherein said working planes of the cutting slide and the anti-buckling device are



bisected by a plane substantially vertical to and intersecting the rotational axis of said workpiece.

4,559,988

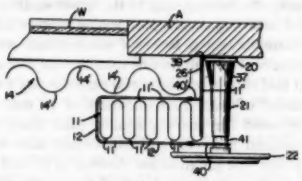
DRAPERY TIEBACK ASSEMBLY

Grace L. Nocerino, 3470 S. Nucla Way, Aurora, Colo. 80013

Filed Apr. 11, 1983, Ser. No. 483,681

Int. Cl.⁴ A47H *19/00, 13/14*

U.S. Cl. 160—349 D **7 Claims**



1. In a drapery tieback assembly adapted for gathering each of a pair of drapes to one side and securing same with a tieback in spaced relation to a wall and to opposite sides of a sheer curtain extending parallel to the wall, said assembly having a pair of tieback holder members with one said holder member disposed outwardly of each side of said curtain, each said holder member including a wall support portion, a stem projecting normal to said wall support portion, and an enlarged distal end spaced from the wall, the improvement comprising: a support bracket for each said holder member including a wall mounting base interposed between said wall support portion and the wall, said wall-mounting base being a relatively thin, flat base plate underlying said wall portion, mounting means interposing said wall mounting base between said wall support portion and said wall, an elongated arm member extending away from said base in closely spaced, parallel relation to said stem and between said stem and said curtain, said arm member being offset from said common mounting means; and first fastener means for securing one end of said tieback to said stem and second fastener means for securing an opposite end of said tieback to said elongated arm spaced between said first fastener means and said wall whereby to retain said drape in spaced parallel relation to the wall and to said sheer curtain.

4,559,989

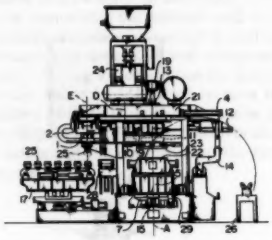
ENTIRELY AUTOMATIC, COLD BOX TYPE MACHINE FOR MOLDING AN INTEGRAL CONNECTING CORE

Kazuo Kawai, Toyonaka; Sumikazu Kawai, and Seiji Katashima, both of Amagasaki, all of Japan, assignors to Naniwa Products Co., Osaka, Japan

Filed Apr. 20, 1983, Ser. No. 486,938

Int. Cl.⁴ B22C *15/24*

U.S. Cl. 164—228 **4 Claims**



1. An entirely automatic, cold box type machine for molding an integral connecting core, which machine is provided with a sand blowing mechanism and a gassing mechanism, said mechanisms being suspended above an upper frame of the molding machine and traversable, and with a liftable drag car being mounted on a platform of the molding machine, characterized in that a rotatable connecting core feeding means is provided at one side portion outside said molding machine, a reversing unloader is provided at the other side portion, and a connecting core transfer car having a connecting core lifting means is traversably suspended from said upper frame in parallel with said sand blowing mechanism and said gassing mechanism.

4,559,990

CONTINUOUS CASTING AND ROLLING DEVICE

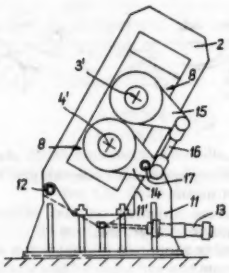
Friedrich Greilinger, Aachen, and Ulrich Katschinski, Mülheim-Heissen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,746

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313542

Int. Cl.⁴ B22D *11/128*

U.S. Cl. 164—428 **8 Claims**



1. A continuous casting and rolling device of the type wherein molten metal is introduced between adjacent rolls by means of a nozzle comprising:

a pair of juxtaposed liquid cooled rolls rotatably mounted in a roll supporting structure with each of said rolls having a respective roll pin extending from one end at one side of said roll supporting structure; a respective coolant connection

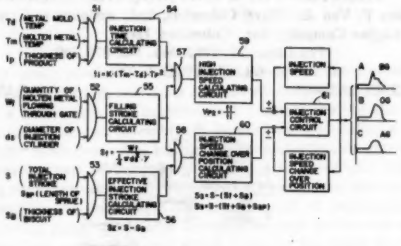
for each of said rolls disposed on the opposite side of said roll supporting structure; a respective geared motor for each of said rolls; respective means for releasably fastening each of said geared motors to a respective one of said roll pins as a freely projecting drive unit; means for securing the housing of one of said geared motors against rotation to said roll supporting structure; and a torque transmitting support means for connecting said housing of said one of said geared motors in articulated communication with the housing of the other of said geared motors.

4,559,991

METHOD AND SYSTEM OF CONTROLLING INJECTION MOLDING MACHINES

Noriyuki Motomura; Hiroyuki Tsuboi, both of Zama, and Sadayoshi Yamada, Ebina, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,450
Claims priority, application Japan, Jun. 3, 1982, 57-94084
Int. Cl.⁴ B22D *17/32*
U.S. Cl. 164—457 **7 Claims**



1. A method of adjusting the injection condition of an injection molding machine in which molten metal in an injection cylinder is injected into a metal mold by an injection plunger operated by an oil pressure operator and in which pressurized oil supplied to said oil pressure operator is adjusted through adjustable valve means actuated by actuator means, said method comprising the steps of:

calculating an injection time, a filling stroke, and an effective stroke;

calculating a high injection speed based on said injection time and said filling stroke;

calculating an injection speed change over position based on said filling stroke and said effective injection stroke;

forming an injection command signal based on said calculated high injection speed and said calculated injection speed change over position; and

applying said injection command signal to said actuator so as to set said adjustable valve means at an optimum injection condition.

3. A system of controlling an injection molding machine of the type wherein molten metal in an injection cylinder is injected into a metal mold by an injection plunger operated by an oil pressure operator and in which pressurized oil is supplied to the oil pressure operator through adjustable valve means actuated by actuator means, said system comprising:

measuring means for measuring various factors relating to an injection condition of said injection molding machine;

means for calculating a high injection speed of said injection plunger based on said measured factors;

means for calculating an injection speed changeover position;

means for calculating an injection command signal based on said calculated injection speed and said calculated injection speed changeover position to provide a predetermined injection pattern; and

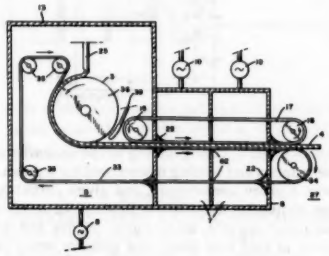
means for operating said actuator means in accordance with said injection command signal so as to adjust said adjustable valve means to a degree of opening necessary to establish an optimum injection condition.

4,559,992

CONTINUOUS VACUUM CASTING AND EXTRACTION DEVICE

John R. Bedell, Madison; Robert W. Smith, Long Valley, and Howard H. Liebermann, Succasunna, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 17, 1983, Ser. No. 458,380
Int. Cl.⁴ B22D *11/06*
U.S. Cl. 164—463 **14 Claims**



6. An apparatus for continuously casting a filament within a zone of preselected vacuum, comprising:

(a) a casting module which delimits a casting chamber having a continuous extrusion means and a rapidly moveable quench surface disposed therein;

(b) module vacuum means for producing said preselected vacuum in said casting module while said filament is rapidly cast;

(c) airlock means for substantially preserving said module vacuum as said filament is continuously transported across a boundary between the effective vacuum in said casting module and a higher pressure in an ambient zone, said airlock means constructed to pass said filament therethrough;

(d) passivator means for passivating said quench surface to inhibit adherence of said filament to said quench surface;

(e) transport means for continuously moving the resultant rapidly advancing filament across said boundary, said transport means comprising an endless entrainment belt which crosses said boundary into said casting chamber through said airlock means and moves in hugging relation to said quench surface to provide a capture area between said entrainment belt and quench surface, and which transports said filament through said airlock means and out from said casting chamber; and

(f) drive means for moving said entrainment belt.

4,559,993

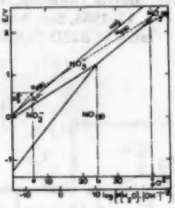
PROCESS FOR STABILIZING A MIXTURE OF MOLTEN ALKALI METAL NITRATES AND ALKALI METAL NITRITES USABLE PARTICULARLY AS A HEAT TRANSFER FLUID AND STABILIZED MIXTURE THUS OBTAINED

Gérard Picard, Charenton le Pont; Thierry Flament, Boulogne Billancourt; Bernard Tremillon, Bure sur Yvette; Pierre Saint-Paul, Samois, and Pierre Spiteri, Avon, all of France, assignors to Electricite de France, Paris, France

Filed Sep. 26, 1983, Ser. No. 536,119
Claims priority, application France, Sep. 27, 1982, 82 16201
Int. Cl.⁴ C01F *11/36*
U.S. Cl. 165—1 **7 Claims**

1. A process of transferring heat from a first zone to a second zone by a heat transfer fluid wherein said heat transfer fluid is a mixture of molten alkali metal nitrates and alkali metal ni-

trites comprising the steps of adding an alkali metal hydroxide to a mixture of alkali metal nitrates and alkali metal nitrites, the quantity of alkali metal hydroxide added being such that the value of the logarithm of the ratio $P(H_2O)/|OH^-|^2$, where $P(H_2O)$ denotes the partial pressure of water vapor expressed in atmospheres and $|OH^-|$ the hydroxide ion concentration expressed in moles/kg, is between a value b corresponding to the disproportionation of the nitrites into nitrate and nitric



oxide and a value a corresponding to the appearance of peroxides, the values a and b being determined for a given nitrate/nitrite ratio, a given temperature, and given partial pressures of the gases blanketing the mixture, heating the resulting mixture of alkali metal nitrates, alkali metal nitrites and alkali metal hydroxides in said first zone, said mixture being in a molten state, transferring the resulting heated molten mixture into said second zone, and removing heat from the heated mixture in said second zone.

4,559,994

PASSENGER VEHICLE HEAT EXCHANGER ARRANGEMENT

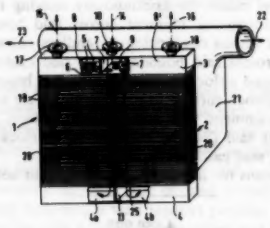
Heinrich Waldmann, Stuttgart; Prasanta Halder, Ditzingen; Wolfgang Volz, Magstadt, and Albert Stolz, Tübingen, all of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,215

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3317983; May 18, 1983, 3317982

Int. Cl.[4] F28D *1/04, 7/08;* **F28F** *9/26*

U.S. Cl. 165—41 **19 Claims**



1. A heat exchanger arrangement for the independent heating of two passenger areas of a motor vehicle passenger compartment comprising:

a first tube and fin block unit for transferring heat between air flowing therethrough and coolant flowing in the tubes thereof to control heating of air for one of said passenger areas,

a second tube and fin block unit for transferring heat between air flowing therethrough and coolant flowing in the tubes thereof to control heating of air for the other of said passenger areas,

common upper and lower coolant tanks for communicating coolant to and from both of said first and second tube and fin block units, and

intake tube means for supplying heated coolant to the lower coolant tank, said intake tube means extending from the upper tank to the lower tank in a common intermediate thermal gap area formed between the first and second tube and fin block units, said intake tube means extending through the fins of said units without contacting said fins so that conductive heat transfer from the intake tube means to the fins of said first and second tube and fin block units is generally avoided.

4,559,995

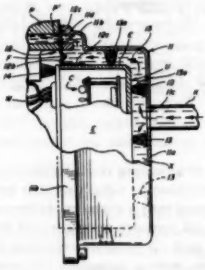
ASSEMBLY FOR COOLING AND DAMPENING VIBRATIONS OF A UNIT MOUNTED THEREIN

Allen F. Van der Stuyf, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 21, 1982, Ser. No. 370,599

Int. Cl.[4] F02B *77/00*

U.S. Cl. 165—47 **7 Claims**



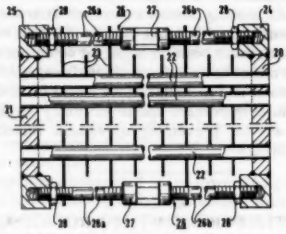
1. An assembly for use in cooling and dampening vibrations of a unit when the latter is mounted on a heat-generating and vibrating supporting surface, said assembly comprising a housing having the interior portion for accommodating and concealing therein the unit, and external marginal portions projecting outwardly from the interior portion and being mountable on the supporting surface; relatively spaced resilient spacer means disposed within the housing interior portion and coacting with surfaces defining the housing interior portion and exterior surfaces of the unit for resiliently retaining the latter in a predetermined spaced relation with the surfaces defining the housing interior portion; relatively spaced ports formed in said housing and communicating with the interior portion thereof and through which a cooling medium is adapted to circulate; and a gasket means of resilient material, said gasket means including an inner section adapted to encompass and be sealingly secured to segments of the unit exterior surfaces disposed within the housing interior portion, an outer section disposed in outwardly spaced substantially encompassing relation with said inner section and adapted to be secured in substantially sandwiched sealing relation between the housing marginal portions and the supporting surface, and a continuous resilient non-porous mediate section interconnecting said inner and outer sections; said spacer means, housing interior surfaces, and said gasket mediate section coacting with a substantial area of the unit exterior to form a chamber for the circulating cooling medium.

4,559,996

MODULAR BUNDLE OF TUBES FOR A STEAM CONDENSER, AND A STEAM CONDENSER USING SUCH MODULAR BUNDLES

Bernard Andrieux, Boulogne-Billancourt, France, assignor to Societe Anonyme Dite-Delas-Weir, Levallois-Perret, France

Filed May 30, 1984, Ser. No. 615,188
Claims priority, application France, Jun. 3, 1983, 83 09229
Int. Cl.[4] F28D 7/00; F28F 11/00; F28B 1/02
U.S. Cl. 165—76 3 Claims



1. A steam condenser comprising a condenser skin containing a bundle of tubes and being operatively coupled at each end with a water tank, the improvement wherein said bundle of tubes comprises an assembly in parallel of a plurality n of modular bundles of tubes, each of said modular bundle of tubes comprising two perforated end plates, a series of said tubes being fitted into the perforations of said end plates and interconnecting the perforated end plates, a set of intermediate supporting plates distributed between the two perforated end plates, both perforated end plates being of the same size, a reinforcing frame surrounding each perforated end plate which is thicker than the perforated end plate and being fixed along the periphery of the end plate to said end plate, draw bars fitted with length adjusting means interconnecting said perforated end plates, said draw bars being fixed to the reinforcing frames and being distributed along said reinforcing frames, an assembly frame having n windows bearing against and being fixed to the reinforcing frame of each modular bundles of tubes on the outside thereof relative to said tubes to effect assembly of the bundle of tubes at each end by means of said assembly frame, the outer perimeter of the assembly frame having an external extension projecting beyond the reinforcing frame forming the outer perimeter of the assembled bundles of tubes, said condenser skin including a flange, and said assembly frame being fixed to said flange, and the condenser skin comprising a passage through the flange which is the same size at each end of the condenser.

4,559,997

SHELL AND TUBE HEAT EXCHANGER WITH TUBE TOP END WIPER TO FREE SOLIDS

Donald R. Cutler, Bolingbrook, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 14, 1983, Ser. No. 561,227
Int. Cl.[4] F28G 3/12
U.S. Cl. 165—94 6 Claims

1. A falling film freeze exchanger, heat exchanger or crystallizer comprising:

a plurality of spaced apart vertical freeze tubes secured in, and penetrating, an upper circular tube sheet and a lower circular tube sheet;

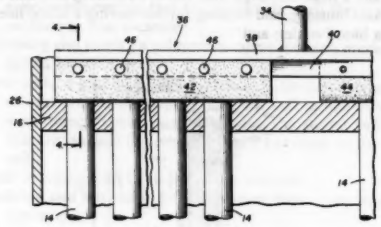
each tube having a top end and a bottom end;

a circular cylindrical shell around the tube sheets and connected thereto;

the shell having a heat exchange fluid inlet and a heat exchange fluid outlet for circulating heat exchange fluid around the tubes between the tube sheets;

a header surrounding and joined to the upper part of the shell and extending above the top tube sheet and above the top end of the tubes;

means to deliver a liquid process feed stream into the header; and



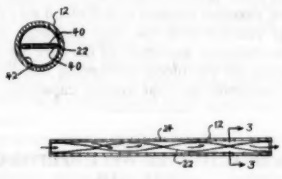
a wiper blade within said header and located entirely outside of the tubes adapted to rotate about a vertical axis, and contact the top ends of a plurality of the tubes.

4,559,998

RECUPERATIVE HEAT EXCHANGER HAVING RADIATION ABSORBING TURBULATOR

Wayne S. Counterman, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,746
Int. Cl.[4] F28F 13/12, 13/18
U.S. Cl. 165—109.1 6 Claims



1. A recuperative heat exchanger for use in transferring heat from a hot gas stream having a temperature of about 1200° F. and higher to a cold stream, comprising:

a. a housing defining a flow conduit therethrough, said housing having an inlet and an outlet for directing the hot gas stream through said flow conduit;

b. a plurality of heat exchange tubes extending through said housing transversely to the flow of hot gas through said flow conduit for directing the cold gas stream therethrough in indirect heat exchange relationship with the hot gas stream flowing over said heat exchange tubes, and

c. turbulator means disposed within said heat exchange tubes for preventing laminar flow in the cold gas stream passing through said heat exchange tubes, said turbulator means being coated with a radiation absorbing material having an absorptivity greater than the absorptivity of the underlying surface of said turbulator means whereby said turbulator means is made a better radiation receiver.

4,559,999

HEAT EXCHANGER FOR EXTRACORPOREAL CIRCUIT

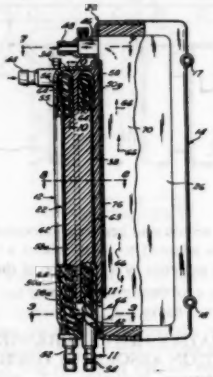
Frank Servas, San Juan Capistrano; John E. Lewin, Santa Ana; Tudor Pavlov, Laguna Niguel, and Lambert J. Diettrich, Jr., Leucadia, all of Calif., assignors to Shiley, Inc., Irvine, Calif.

Filed Apr. 8, 1983, Ser. No. 483,377
Int. Cl.[4] F28D 7/12
U.S. Cl. 165—156 15 Claims

1. A heat exchanger for regulating the temperature of blood flowing in an extracorporeal blood circuit comprising:

a plurality of closely spaced heat exchange tubes for conducting a heat exchange fluid, outwardly extending rib means formed along the length of each of said tubes;

a housing enclosing the tubes with a heat exchange fluid inlet and a heat exchange fluid outlet extending into and out of said housing, said housing further having a blood inlet and a blood outlet; and



a flexible core positioned between the heat exchange tubes and resiliently urging the tubes against the housing and shaped to form, in combination with the housing and said rib means, passages through which blood may flow in heat exchange relation with the heat exchange fluid in the tubes, the resiliency and shape of the core being such that substantially all the blood is directed through said passages to maximize the heat transfer capability.

4,560,000

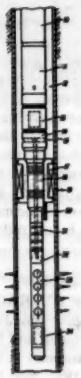
PRESSURE-ACTIVATED WELL PERFORATING APPARATUS

James M. Upchurch, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 369,209, Apr. 16, 1982. This application Mar. 17, 1983, Ser. No. 476,074

Int. Cl.[4] E21B *43/116*

U.S. Cl. 166—55.1 **10 Claims**



1. Firing appartus for use with a well perforating gun of the type having a carrier containing a plurality of shaped-charges, and detonating means for actuating said charges, comprising:

a tubular housing adapted to be connected to said carrier;

firing pin means mounted in said housing for movement from a first position spaced from said detonating means to a second position impacting said detonating means, said firing pin means having a transverse cross-sectional area subject to well pressure to cause such movement;

releasable means for locking said firing pin means in said first position; and

differential pressure responsive means for releasing said locking means to enable said well pressure to move said firing pin means to said second position;

wherein said locking means comprises laterally shiftable latch means on said housing, said latch means being movable from an inner position engaging detent means in said firing pin means to an outer position disengaged from said detent means, and locking surface means on said differential pressure responsive means normally engaging said latch means for preventing movement thereof to said outer position.

4,560,001

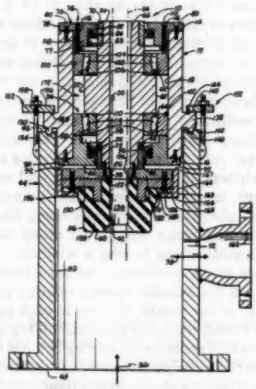
LID ADAPTER FOR USE WITH A ROTATING HEAD

Don E. Gonzales, P.O. Box 651, Burns Flat, Okla. 73624

Filed Feb. 23, 1983, Ser. No. 468,900

Int. Cl.[4] E21B *33/03*

U.S. Cl. 166—84 **11 Claims**



1. A rotating head adapted for use in drilling a well borehole at a well drilling site wherein drilling fluid is passed into the well borehole and wherein some of the drilling fluid is passed from the well borehole and wherein a rotatable kelly extends into the well borehole during the drilling operations, comprising:

an outer barrel having an upper end, lower end and an outer barrel bore extending therethrough and intersecting the upper and lower ends thereof;

an inner barrel having an upper end, lower end and an inner barrel bore extending therethrough and intersecting the upper and lower ends thereof, at least a portion of the inner barrel being disposed in the outer barrel bore and a portion of the kelly being extendable through the inner barrel bore during the drilling operations;

means for providing a fluid seal between the inner and outer barrels;

means for rotatingly supporting the inner barrel on the outer barrel;

an adapter plate having an opening extending through a central portion thereof through which the kelly is extendable during the drilling operations, the adapter being connected to the lower end of the inner barrel with the

opening in the adapter being generally aligned with the inner barrel bore;

a plurality of bolts threadedly extending through the adapter plate and extending through a portion of the elastomeric member for connecting the adapter plate to the elastomeric member;

an elastomeric member having an upper end, a lower end and a drive bore extending through the elastomeric member and intersecting the upper and the lower ends thereof, the upper end of the elastomeric member being connected to the adapter plate with the drive bore through the elastomeric member being aligned with the opening in the adapter and the inner barrel bore, the kelly being extendable through the drive bore in the elastomeric member and the elastomeric member sealingly engaging the portion of the kelly extending through the drive bore;

a lid base having a generally cylindrical shape, an upper end, a lower end and a lid opening extending therethrough intersecting the upper and the lower ends thereof, the upper end portion of the lid base being connected to the adapter plate; and

a lid flange being connected to the lower end portion of the lid base and extending a distance radially inwardly into the lid opening to a position wherein the end of the lid flange, opposite the end of the lid flange connected to the lid base, is disposed generally near the elastomeric member, the lid flange cooperating with the lid base to encompass a space and portions of the bolts connecting the adapter plate to the inner barrel being disposed in said space so the lid base and the lid flange cooperate to retain any of said bolts in the event any of said bolts become inadvertently unthreaded, the lid base and the lid flange not functioning to connect the elastomeric member to the lower end of the inner barrel.

4,560,002

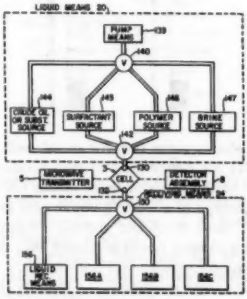
TWO DIMENSIONAL MICROWAVE CHEMICAL FLOOD TESTING MEANS AND METHOD

Lorne A. Davis, Jr., and Helen K. Haskin, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 357,922, Mar. 15, 1982, Pat. No. 4,519,982. This application Jan. 6, 1984, Ser. No. 568,680

Int. Cl.[4] E21B *49/00*

U.S. Cl. 166—252 **13 Claims**



1. A method of two dimensional chemical flood testing comprising:

evacuating a test cell having an entry port and an exit port and containing a porous medium, said test cell having side dimensions which are substantially greater than a thickness dimension of said test cell;

providing different liquids to said entry port in a predetermined sequence;

receiving the different liquids from said exit port;

irradiating the porous medium with a beam of microwave energy using a microwave transmitter at a plurality of predetermined locations of said test cell defined by a two axis coordinate system, said irradiating step being conducted upon evacuation of said test cell and repeated for each type of liquid while it is in said test cell,

detecting at each location, with a microwave receiver, the microwave energy that has passed through the porous medium at that location,

deriving and storing a calibration curve for each predetermined location, and

providing a graphical representation of the liquid content of said porous medium in said test cell in accordance with detected microwave energies, the stored calibration curves, and the predetermined locations on the test cell;

said irradiating and detecting step includes:

holding said test cell in a fixed position with a first mounting means,

mounting said transmitter means and said receiver means on a second mounting means and on a third mounting means, respectively, in a manner so that they are aligned with each other and having sufficient space between them so that said test cell may be interposed between said transmitter means and said receiver means,

moving said second and third mounting means in unison along an X axis with a first moving means,

mounting said first moving means on fourth and fifth mounting means,

moving said fourth and fifth mounting means along a Y axis, which is perpendicular to the X axis, with a second moving means, and

controlling the movement of the second and third mounting means and the fourth and fifth mounting means so that the transmitter means and the receiver means will stop temporarily at predetermined locations on the test cell for the microwave irradiation through the porous medium at that location; and

said liquid providing step which includes:

containing liquids to be provided crude oil, or a substitute, a surfactant, a polymer and brine in an equal number of containers,

pumping a non-corrosive liquid with pump means,

controlling the liquid provided by said pump means to be provided to either the crude oil or substitute container, the surfactant container, the polymer container, or the brine container so as to displace crude oil from the crude oil container, surfactant from the surfactant container, polymer from the polymer container, or brine from the brine container with a valve means,

directing the brine, the polymer, the surfactant, or the crude oil or its substitute, into said test cell with a second valve means acting in cooperation with said first valve means,

said liquid receiving step includes:

providing the liquid flowing from the sample cell to an appropriate receptacle means of a plurality of receptacle means with a third valve means acting in cooperation with said first and second valve means.

4,560,003

SOLVENT STIMULATION IN HEAVY OIL WELLS PRODUCING A LARGE FRACTION OF WATER

James M. McMillen, Arlington, and Lynn D. Mullins, De Soto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 420,418, Sep. 20, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,229

Int. Cl.[4] E21B *43/25*

U.S. Cl. 166—305.1 **28 Claims**

1. A method for stimulating the recovery of oil having a large fraction of free water flowing from a production well penetrating a subterranean, viscous oil-containing formation consisting essentially of:

(a) injecting a predetermined amount of a fluid consisting of

a solvent into said production well to displace water away from said production well, said solvent having a density and viscosity substantially less than the viscous formation oil and a viscosity equal to or slightly greater than the water at the formation conditions;

(b) shutting-in said production well for about 1 to about 10 days to allow the formation around said production well to undergo a soak period whereby the injection solvent fingers upwardly under the influence of gravity dissolving in the oil and reducing its viscosity; and

(c) opening said production well and recovering from said production well fluids, including oil, containing substantially less water than from the unstimulated well.

4,560,004

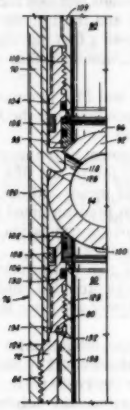
DRILL PIPE TESTER - PRESSURE BALANCED

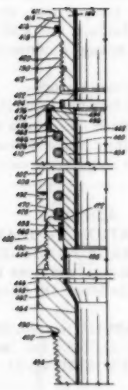
Donald W. Winslow, and Gary Q. Wray, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 30, 1984, Ser. No. 615,443

Int. Cl.[4] E21B *34/08*

U.S. Cl. 166—321 **8 Claims**





1. A pipe tester valve comprising:

a housing having a first end adapted to be connected to a string of pipe, and having a flow passage therethrough;

a spherical valve member disposed in said flow passage of said housing;

lug means, attached to said housing, for engaging said spherical valve member and rotating said spherical valve member between open and closed positions wherein said flow passage is open and closed, respectively, as said spherical valve member is moved axially relative to said housing and said lug means;

moving means for moving said spherical valve member axially relative to said housing between the open and the closed positions; and

an automatic pressure compensating piston assembly connected to the moving means to compensate for any decrease in the volume of said pipe tester valve during the actuation thereof.

4,560,005

SLIDING-SLEEVE VALVE FOR AN OIL WELL

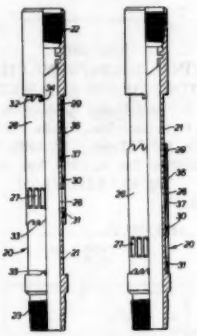
Paul M. Helderle, Boulogne; Fabrice R. Arnaud, Paris, and Yannick Le Nours, Lorient, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 24, 1984, Ser. No. 685,942

Claims priority, application France, Dec. 23, 1983, 83 20661

Int. Cl.[4] E21B *34/06, 34/14*

U.S. Cl. 166—332 **9 Claims**

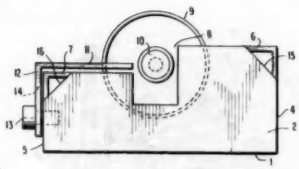


1. A sliding-sleeve valve (20) for an oil well, comprising: a valve body (21) for connection to two production-tube elements (24, 25) of the oil well, port means (28) in said valve body for the passage of a fluid, a sleeve (26) arranged on the outside of said valve body and slidable longitudinally therealong between a closing position closing said port means and an opening position exposing said port means, a receiving rack (36) having drive teeth provided on a radially inner surface of said sleeve, an access orifice (37) in said valve body providing access to said teeth, and an actuating tool (48) adapted to be activated from the surface of the well for displacing said sleeve from one of said positions to the other, said actuating tool comprising a bush (49) provided with an outlet orifice (52) and which is insertable and orientable in said valve body so as to align said outlet orifice with said access orifice, an engagement and drive member (69) for engaging said teeth and driving said sleeve longitudinally, ramp means (61) and an actuating rod (54) displaceable longitudinally in said bush for causing by means of said ramp means said engagement and drive member to project laterally through said outlet and access orifices into engagement with said teeth.

4,560,006
APPARATUS FOR HOOF WORKING

Eigel Sjöberg, Skepparevägen 29, S-432 03 Varberg, Sweden

PCT No. PCT/SE83/00279, § 371 Date Mar. 15, 1984, § 102(e) Date Mar. 15, 1984, PCT Pub. No. WO84/00279, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 11, 1983, Ser. No. 589,806
Claims priority, application Sweden, Jul. 15, 1982, 8204336
Int. Cl.[4] A01L *11/00*
U.S. Cl. 168—48 A 8 Claims



1. An apparatus for working of hooves of hoofed animals, especially horses, comprising a housing having two abutting faces (6, 11) arranged on each side of a cutting tool (10), wherein one of the abutting faces (6) is fixed and placed at the same level as the surface of the cutting tool (10) and the other abutting face (11) is displaced in parallel from the surface of the cutting tool (10), so that part of the cutting tool (10) is free to work off material from a hoof of an animal, said cutting tool (10) being coupled to an output shaft of a drive means so that the shaft of the cutting tool (10) is an axial extension of the output shaft of the drive means, the cutting tool (10) being positioned in a space (8) formed between said abutting faces (6, 11), said housing is provided with a holder (9) which is an extension of the drive means and surrounds the output shaft of the drive means, said extension providing a handgrip for hand holding of the apparatus, said housing providing an end wall (3) of said handgrip, said end wall extending outside of the holder and thereby providing a support for a hand holding the apparatus.

4,560,007
FIRE PREVENTION AND EXTINGUISHING ASSEMBLY

James O. Molloy, Belmont; Peter E. Sydenham, London, and Roman A. Hulejczuk, Crawley, all of England, assignors to Fisons plc, Ipswich, England

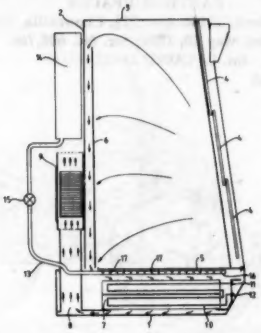
Filed Feb. 6, 1984, Ser. No. 577,246
Claims priority, application United Kingdom, Feb. 8, 1983, 8303483; Oct. 11, 1983, 8327174
Int. Cl.[4] A62C *35/02*
U.S. Cl. 169—54 5 Claims

1. A fire prevention and extinguishing system which comprises:

a carbon bed including an optical fibre which extends throughout said bed, said fibre being in optical communication between a light transmitter and a light detector,

a supply of fire extinguishing fluid communicating with said bed by means of a conduit, said conduit being provided with a valve, said valve being actuable by an effective decrease in light detected by said detector,

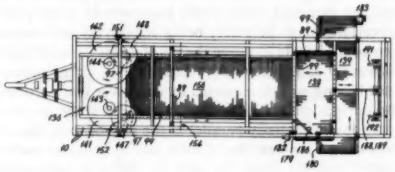
said fibre being fusable at a predetermined elevated temperature, such that in operation fusion of said fibre at said temperature causes an effective decrease in light detected by said detector, actuation of said valve and flow of fire extinguishing fluid to said bed.



4,560,008
ROOT CROP HARVESTER

John Carruthers, Roslin, Scotland, assignor to National Research Development Corp., London, England

Continuation of Ser. No. 420,573, Sep. 20, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 653,470
Claims priority, application United Kingdom, Sep. 24, 1981, 8128854
Int. Cl.[4] A01D *17/00*
U.S. Cl. 171—14 10 Claims

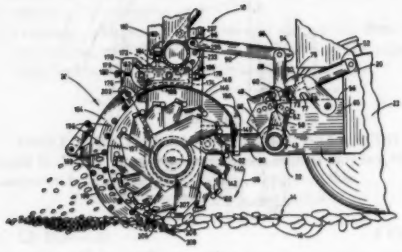


1. A root crop harvester including means for removing the crop from the soil and discharging the removed crop, first, second and third conveyor means for receiving the crop discharged by said removing means and for transporting and separating the crop from soil so that the crop can be discharged for collection, whereby the crop moves sequentially from the first to the second and thereafter to the third conveyor means, said second conveyor means including a transversely disposed horizontal conveyor-sieve for moving the crop in a first widthwise direction following receipt of the crop from said first conveyor means, said second conveyor means also acting as a sieve and including drive means for driving said second conveyor means and means for suspending and oscillating said second conveyor means so that said second conveyor means is oscillatable in a direction substantially along a plane parallel with the upper crop supporting surface thereof, said second conveyor means discharging directly onto said third conveyor means so that the later can directly discharge the crop from the harvester.

4,560,009
APPARATUS FOR PULVERIZING AGGREGATE MASSES OF FRANGIBLE MATERIALS ON AND BELOW EARTH SURFACES

Lester R. Lindbeck, 19194 Ave. 22½, Chowchilla, Calif. 93610

Filed May 10, 1984, Ser. No. 608,766
Int. Cl.[4] A01B *33/02, 35/18*
U.S. Cl. 172—66 19 Claims



1. An apparatus adapted to be connected rearwardly on a powered prime mover for towing of the apparatus forwardly along a selected path of travel on an earth surface for pulverizing aggregate masses of frangible materials deposited on and below the earth surface, the apparatus comprising:

a frame providing an elongated transverse member having spaced, opposite end portions and a pair of elongated upright members mounted on the end portions, each upright member having a predetermined upper end portion and an opposite lower end portion;

a mounting assembly secured on the frame and adapted to be connected rearwardly on the prime mover to dispose the transverse member transversely of the path of travel of the prime mover, the mounting assembly providing means selectively operable to raise and lower the frame relative to the earth surface to dispose the lower end portion in a selected attitude spaced from the earth surface;

a hinge assembly mounted on the frame and defining a pivotal axis disposed substantially transversely of the path of travel, the hinge assembly being selectively and independently adjustable to move the pivotal axis defined thereby forwardly and rearwardly relative to the prime mover;

a rotor having an axle mounted by the lower end portions of the upright members for driven rotation about an axis of rotation substantially parallel to the pivotal axis, the rotor providing a multiplicity of teeth having hammer portions spaced radially from the axle to define a substantially cylindrically configured periphery having a predetermined lowermost portion disposed remotely from the upper end portions of the upright members and adapted to be brought into contact with the earth surface;

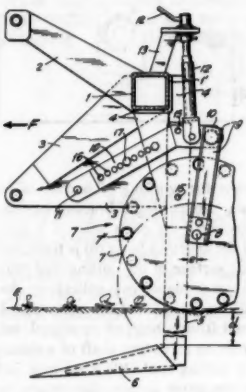
drive means for imparting rotary motion to the rotor in a direction wherein the lowermost portion of the rotor periphery moves rearwardly relative to the prime mover; and

a grid member having an arcuate configuration of a greater radius than that of the rotor, the grid member providing a porous portion having a plurality of substantially straight transverse rods and a plurality of substantially arcuate pieces interconnected to define and bound a multiplicity of holes, and a strike plate portion having a surface of predetermined area, the grid member being mounted on the hinge assembly for pivotal movement thereof to deploy the surface of the strike plate in an operative attitude in spaced relation to the lowermost portion of the rotor periphery with the porous portion disposed in spaced relation to portions of the rotor periphery rearward of the lowermost portion.

4,560,010
SOIL LAYER CULTIVATOR WITH A PRESSURE ROLLER UNIT

Ernst Weichel, Bahnhofstrasse 1, D-7326 Heiningen, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,076
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128709
Int. Cl.[4] A01B *49/02*
U.S. Cl. 172—177 7 Claims



1. A soil cultivator for movement in a working direction for a deep loosening of compact, arable soil, green surfaces or the like, comprising a frame tube which extends transversely of the working direction and has a front side facing in the working direction and an opposite rear side, a three-point connection attached to said frame tube and having an upper part and lower parts, support posts depending downwardly from said frame tube and having a front side facing in the working direction and an oppositely facing rear side, wing-shaped loosening elements secured to the lower ends of said support posts on the front sides thereof with the working width of said loosening elements extending in the direction of said frame tube laterally outwardly from both sides of said support posts so that the outer ends of said loosening elements are closely spaced apart, said support posts are vertically adjustable for selectively positioning said loosening elements at a desired depth below the ground surface, wherein the improvement comprises a pressure roller (7) is hinged to said frame tube (1) and extends over the entire working width of said loosening elements (6), said pressure roller is freely rotatable and extends at least with part of circumferential periphery thereof in vertical projection above said loosening elements (6), said pressure roller (7) comprises a plurality of individual partial roller sections (7*a* to 7*f*), at least one common shaft connecting said roller sections together and spacing adjacent said partial roller sections apart at a mutual axial spacing (a) therebetween greater than the dimension of said support posts extending transversely of the working direction, and said partial sections project from the rear side of said frame tube (1') into the respective spaces (b and c) between adjacent said support posts (5), a stirrup-shaped yoke (9) supports said at least one common shaft (8) of said pressure roller (7), and said yoke is hinged to be pivoted at said lower parts (3) of said three-point connection by elongated levers (10) which can be adjusted in the elongated direction thereof, and adjusting spindles connected to said pressure roller for vertically adjusting said roller.

4,560,011

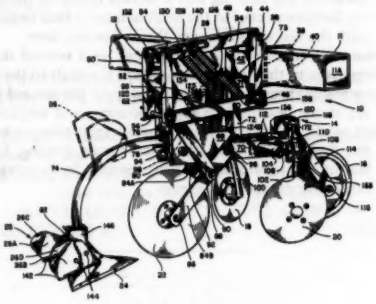
CULTIVATOR ROW UNIT WITH RIDGER/BEDDER IMPLEMENT

Richard L. Peterson, Le Sueur; James A. Johnson, Cologne; Roger J. Scheurer, Kasota, and Richard W. Steinberg, Mankato, all of Minn., assignors to Hiniker Company, Mankato, Minn.

Division of Ser. No. 383,595, Jun. 1, 1982, Pat. No. 4,461,355. This application Jun. 22, 1984, Ser. No. 623,789

Int. Cl.[4] A01B *39/14, 39/20*

U.S. Cl. 172—194 **5 Claims**



1. In an inter-row crop cultivator for use in conservation tillage applications and having a frame adapted to be pulled by a traction vehicle, the combination comprising:

a plurality of sweeps carried by said frame, each sweep located between adjacent crop rows and including a shank for mounting said sweep to said frame;

a ridger/bedder attachment for each sweep and movable along the shank thereof between a raised non-use position and a lowered use position, said ridger/bedder attachment having a pair of wings extending from the center thereof in an upward, laterally outward and rearward direction such that when said attachment is in said use position it is located immediately behind its associated sweep and cooperate with said sweep to raise and laterally deflect soil and trash worked by said sweep, and when said attachment is raised to the non-use position, it is out of substantial contact with soil worked by said sweep; and

means carried by each attachment for selectively securing said attachment to the shank of its associated sweep either in said use or said non-use position.

4,560,012

DRILL COLLAR STRUCTURE FOR USE IN DEVIATED WELL BORE DRILLING

Branch M. McNeely, Jr., 5313 Pine St., Bellaire, Tex. 77401

Continuation-in-part of Ser. No. 622,523, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 479,257, Mar. 28, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 658,896

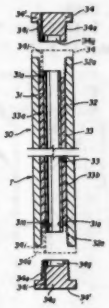
Int. Cl.[4] E21B *7/04*

U.S. Cl. 175—61 **10 Claims**

8. A method of drilling a deviated well bore comprising the steps of:

securing adjacent a drill bit on the lower end of a drill string at least one tubular structure formed by spaced inner and outer tubes with rigid filler material therebetween to preclude relative movement between the inner and outer tubes, the structure having a longitudinal bore, displacing at least about one-third of its weight in water and having a moment of inertia not exceeding about 80% of a solid wall tube of substantially the same inner and outer diameter as the tubular structure;

circulating drilling fluid through the drill string and bore of the tubular structure to discharge through the drill bit; and



rotating the drill string with the tubular structure therein while circulating the drilling fluid through the bore thereof to drill the deviated well bore.

4,560,013

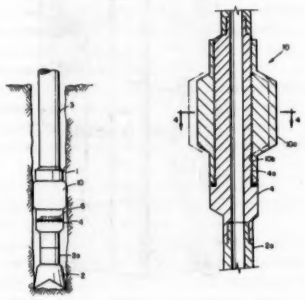
APPARATUS FOR DIRECTIONAL DRILLING AND THE LIKE OF SUBTERRANEAN WELLS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 16, 1984, Ser. No. 580,946

Int. Cl.[4] E21B *7/08*

U.S. Cl. 175—73 **7 Claims**



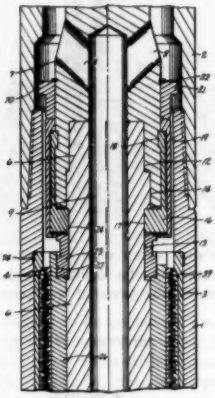
1. An apparatus for inclusion in the drive mechanism for a rotary well tool for effecting a lateral displacement of the rotary axis of the rotary tool relative to the previously drilled well bore, comprising, in combination: a member concentrically mountable relative to the output shaft of a downhole motor for the rotary tool; said member having a generally cylindrical external surface having an axis parallel to but laterally offset by a first distance from the rotary axis of the output shaft; a hollow housing having a generally cylindrical bore surface engagable with said generally cylindrical external surface of said member and an external cylindrical guide surface engageable with the wall of the well bore; the axis of said generally cylindrical guide surface being parallel to and laterally offset from the axis of said generally cylindrical bore surface by a selected distance; and means for securing said hollow housing in any selected angular position relative to said member, thereby laterally displacing the rotary tool relative to the bore hole by a selected distance.

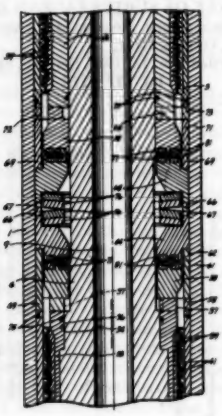
4,560,014

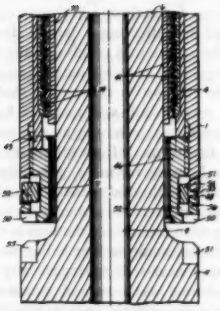
THRUST BEARING ASSEMBLY FOR A DOWNHOLE DRILL MOTOR

Bela A. Geczy, Orange, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 5, 1982, Ser. No. 365,614
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175—107 **52 Claims**







1. A thrust bearing assembly for a downhole fluid motor comprising:

a stationary housing;

a rotatable shaft extending through the housing;

a first pair of opposed annular friction thrust bearing faces comprising a first stationary thrust bearing face connected to the housing and a first rotatable thrust bearing face connected to the shaft and in face-to-face engagement with the first stationary thrust bearing face;

means for transmitting a thrust load in a first direction from the shaft to the first rotatable thrust bearing face and from the first stationary thrust bearing face to the housing;

a second pair of opposed annular friction thrust bearing faces comprising a second stationary thrust bearing face connected to the housing and a second rotatable thrust bearing face connected to the shaft in face-to-face engagement with the second stationary thrust bearing face;

means for transmitting a thrust load in a second direction opposite to the first direction from the shaft to the second rotatable thrust bearing face and from the second stationary thrust bearing face to the housing; and wherein

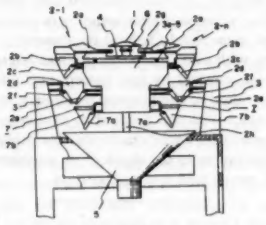
both means for transmitting comprise spring means between the first and second stationary thrust bearing face for biasing the stationary thrust bearing faces toward the respective rotatable bearings.

4,560,015

COMBINATORIAL WEIGHING APPARATUS

Kazukiyo Minamida, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation of Ser. No. 414,648, Sep. 3, 1982, Pat. No. 4,454,924. This application Jun. 18, 1984, Ser. No. 621,386
Claims priority, application Japan, Sep. 4, 1981, 56-139982
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.[4] G01G *19/22, 13/16*
U.S. Cl. 177—25 **8 Claims**



1. A method of combinatorial weighing of articles fed in batches through a plurality of corresponding input, weighing and storing paths for selecting a combination of said batches which provides a sum weight value satisfying a predetermined condition and for selective discharge of said selected combination of batches, comprising:

in a given weighing and storing cycle of operation, supplying articles to provide batches of articles substantially simultaneously to at least selected ones of said plurality of input, weighing and storing paths, substantially simultaneously measuring the batches so supplied to determine the corresponding weight values thereof at a given, common position in each of said paths, storing the weight values for said measured batches while maintaining the identity of the respective batches, withdrawing the thus identified batches from the weighing positions in the respective said paths and retaining the identified batches in said paths,

in a successive weighing and storing cycle of operation, supplying articles to provide batches of articles substan-

tially simultaneously through at least selected ones of said plurality of input, weighing and storing paths, substantially simultaneously measuring the batches thus supplied to determine the corresponding weight values thereof and retaining said batches in said respective paths, and

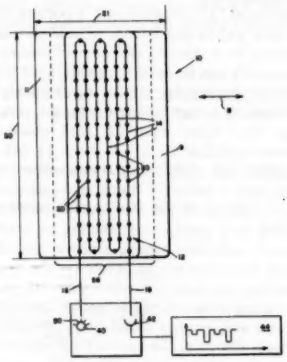
in a combination selection cycle, monitoring the weight values of the batches retained in the respective input, weighing and storing paths, for selecting a specific combination of those weight values which provides a sum weight satisfying said predetermined condition, and discharging the respective, identified batches having the weight values determined to satisfy the predetermined condition, and collecting the selectively discharged batches.

4,560,016

METHOD AND APPARATUS FOR MEASURING THE WEIGHT OF A VEHICLE WHILE THE VEHICLE IS IN MOTION

Paul Ibanez, Woodland Hills; John Stoessel, Santa Monica, and Donald C. Barrett, Venice, all of Calif., assignors to Anco Engineers, Incorporated, Culver City, Calif.

Filed Dec. 14, 1983, Ser. No. 561,209
Int. Cl.⁴ G01G *3/14, 19/52, 19/02;* **G02B** *5/14*
U.S. Cl. 177—210 R **12 Claims**



1. An apparatus for measuring the weight of a vehicle in motion comprising:

a. a substantially flat pad;

b. said pad being substantially rectangular in shape;

c. said pad containing a first ramp on one of its lengthwise sides and a second ramp on its other lengthwise side;

d. an optic fiber embedded into said pad with the leading end and the trailing end of the optic fiber protruding from said pad;

e. a multiplicity of microbending fixtures distributed along the length of said optic fiber at spaced locations. apart from each other;

f. a light source located at the leading end of said optic fiber;

g. a light receiver located at the trailing end of said optic fiber;

h. said light receiver connected to an output transformer; and

i. said first ramp and said second ramp containing a data trigger and velocity sensing system which turns the light source, the light receiver, and the output transformer on when a vehicle runs over the first ramp and off when a vehicle runs over the second ramp;

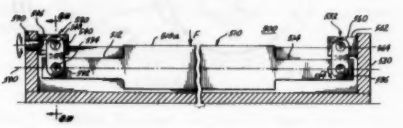
j. whereby when said pad is placed on a roadway and when a force is exerted on said pad by a vehicle running over it, said discrete microbending fixtures are caused to pinch said optic fiber and thereby attenuate the light transmitted from said light source to said light receiver, and said output transformer can calculate the force exerted on said pad and therefore the weight of the vehicle by knowing the light input from the light source and the light ouput received by the light receiver.

4,560,017

VEHICLE PLATFORM SCALE

Robert B. Hood, Snohomish, Wash., assignor to Lodec, Inc., Lynnwood, Wash.

Filed Feb. 16, 1984, Ser. No. 580,945
Int. Cl.⁴ G01G *3/14, 21/24*
U.S. Cl. 177—211 **30 Claims**



1. A scale comprising:

a load-bearing surface;

a load cell assembly including a deflectable load cell having a load receiving surface, a support for said load cell and suspension means for suspending said load cell from said load cell support;

means for mounting the load-bearing surface on said load receiving surface of said load cell such that a load on said load-bearing surface is transmitted to said load receiving surface and applies a predetermined strain to said load cell;

strain transducer means mounted to said load cell for producing an output signal corresponding to said strain condition of the load cell;

said load cell suspension means including:

first and second pivot means located at spaced-apart portions of said load cell for producing rotational deflective motion of the intermediate portion of said load cell about said first and second pivot means responsive to said transmitted load-bearing surface load,

said first pivot means comprising a first pair of pins projecting from opposite sides of a first end of said load cell,

said second pivot means comprising a second pair of pins projecting from opposite sides of a second end of said load cell,

the axial axes of said first and second pair of pins being positioned in a plane normal to a transmitted load-bearing surface load,

said load cell support having seats for receiving each of said first and second pair of pins, said seats being predeterminedly configured such that said pins may rotate within said seats, while being constrained from translational displacement in a direction parallel to said transmitted load-bearing surface load,

said load cell assembly, said load-bearing surface and said load-bearing surface mounting means cooperating whereby the strain applied to said load cell resulting from a load is substantially independent of the position of said load on said load-bearing surface.

4,560,018

WHEEL TANDEM DRIVE MECHANISM

Ronald L. Satzler, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

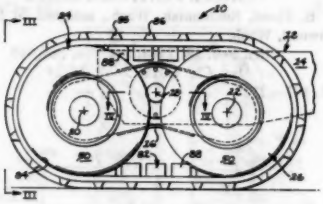
Filed May 10, 1984, Ser. No. 608,757
Int. Cl.⁴ B62D *55/00, 3/00;* **F16H** *35/00*
U.S. Cl. 180—9.1 **33 Claims**

1. A wheel tandem drive mechanism for a vehicle having a frame and being capable of traveling in a normal forward longitudinal direction over uneven terrain, comprising:

a housing;

means for oscillatably connecting the housing to the vehicle frame on an axis;

rear and front wheel assemblies individually having a wheel with a radially outwardly facing elastomeric peripheral surface, the wheel assemblies being rotatably connected to the housing away from the axis;



an elastomeric belt entrained about the peripheral surfaces of the wheels and solely frictionally connecting the wheel assemblies;

an input drive member; and

planetary gear set drive means for powerably delivering torque to the rear and front wheel assemblies with a differential action at a preselected torque ratio for driving the belt in response to rotation of the input drive member.

4,560,019

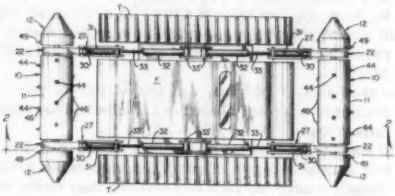
ALL-TERRAIN VEHICLE WITH TRACTIVE ROLLER ASSEMBLY

William F. Barber, R.R. No. 4, Olney, Ill. 62450

Filed Jun. 4, 1984, Ser. No. 616,980

Int. Cl.⁴ B62D *55/00*

U.S. Cl. 180—9.32 **21 Claims**



1. In a track-type vehicle having a vehicle body with ground-engaging tracks mounted on said vehicle body for advancing said vehicle along a ground surface, a boom member pivotally mounted for swinging movement through a vertical plane relative to one of the front and rear ends of said vehicle body, said boom member supporting a generally cylindrical, cleated roller assembly thereon, the combination therewith comprising:

said generally cylindrical cleated roller assembly having a generally cylindrical housing, a plurality of fingers eccentrically mounted within said housing for extension and retraction with respect to said housing as said housing is rotated;

means drivingly connected to said housing for rotating said housing; and

pivot control means drivingly connected to each of said boom members at one end of said vehicle body to control pivotal movement of said boom and attached cylindrical cleated roller assembly.

4,560,020

LIGHT MOTORBIKE WITH TAKEOFF FOR POWERING SEPARATE DEVICES

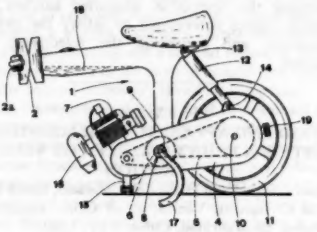
Giancarlo Mambelli, Bologna, Italy, assignor to Motomec S.r.l., Longiano, Italy

Filed Dec. 13, 1983, Ser. No. 560,811

Claims priority, application Italy, Dec. 17, 1982, 5159/82[U]

Int. Cl.⁴ B62K *15/00*

U.S. Cl. 180—53.1 **2 Claims**



1. Light motorbike with takeoff for powering separate devices, comprising:

an inverted "L" shaped frame, a portion of which is used as a tank and having a front tubular part adapted to be connected to a steering and control assembly, whereby said assembly can be readily disconnected from the remainder of the motorbike, all the mechanical transmission and electrical cables belonging to the steering and control assembly being equipped with quick fastening/release couplings;

a rigid casing containing a transmission and supported by a pin from a rod of the frame, said casing carrying, cantilevered thereto on one end, an engine and containing, centrally at a point corresponding to where said pin is located, reduction means, a power takeoff connectable to said reduction means, while on the opposite end of the casing, the casing is provided with a coupling pin for securing a rear driving wheel, the connection between the frame and the rear wheel being effected through a single shock absorber, one extremity of which is fastened to the frame, and the other to the casing;

a pair of extractable foot rests that are secured to a bottom of the casing and integral therewith, said foot rests adapted for resting the casing on the ground at the time the steering and control assembly has been removed, defining an inclination of the upper part of the frame, with respect to the horizontal, at a negative acute angle; and

means for disconnecting said rear wheel from the reduction means when said power takeoff is being used.

4,560,021

CONTROL SYSTEM FOR A PLURALITY OF ENGINE UNITS

Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00359, § 371 Date Apr. 8, 1983, § 102(e) Date Apr. 8, 1983, PCT Pub. No. WO83/00847, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 8, 1982, Ser. No. 491,329

Claims priority, application Japan, Sep. 9, 1981, 56-142764[U]

Int. Cl.⁴ B60K *23/00, 5/08*

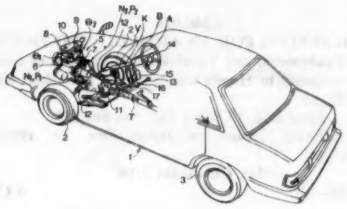
U.S. Cl. 180—54.1 **5 Claims**

1. In a control system for an internal combustion engine for a vehicle, the engine having a plurality of independent engine units including a primary engine unit and at least one auxiliary engine unit, an output shaft operatively connected to said engine units, with a clutch for transmitting an output of one of said engine units to said output shaft, the system having a

plurality of sensors for sensing conditions of operation of the engine and of said vehicle, the improvement comprising

a throttle valve of each of said engine units respectively,

control means for judging signals from said sensors and for producing signals for controlling said throttle valve of each of said engine units and said clutch, and



selecting means for manually selecting said signals from said sensors in accordance with respectively selected driving conditions of said vehicle and for applying the selected signals from said sensors to said control means, such that said throttle valves and said clutch are controlled by said signals from said control means in accordance with the respective selected driving condition of said vehicle.

4,560,022

ELECTRICALLY DRIVEN CHILDREN'S VEHICLE

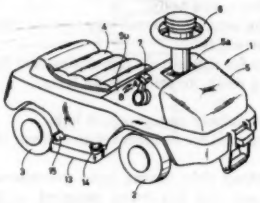
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Jul. 12, 1984, Ser. No. 630,220

Claims priority, application Japan, Jul. 22, 1983, 58-114726[U]

Int. Cl.[4] B60K *1/00, 17/00;* **B62D** *11/00*

U.S. Cl. 180—65.1 **4 Claims**



1. An electrically driven children's vehicle comprising: a vehicle body having front wheels, rear wheels, a steering wheel for steering said front wheels, and a seat formed on top of said vehicle body, an electric motor mounted in said vehicle body for rotatively driving said front or rear wheels, said electric motor having respective power input terminals, a clutch lever attached to said vehicle body for turning on and off the transmission of torque from said motor to the front or rear wheels, a forward travel pedal means operable for rotating said front or rear wheels in the forward direction, a backward travel pedal means operable for rotating said front or rear wheels in the backward direction, said forward and backward travel pedal means being attached to the vehicle body and positioned relative to each other so that a forward travel pedal is located forwardly of a backward pedal at a place where said pedals can be operated by a foot, and a motor drive circuit including circuit switch means responsive to said forward and backward pedal means so that when said forward or backward travel pedal means is depressed, said motor rotates forwardly or backwardly, respectively, and so that said motor is stopped when the two pedals are simultaneously depressed, said circuit switch means comprising forward and backward travel changeover switches having common terminals connected to said electric power terminals of said electric motor, said changeover switches having normally closed contact means connected together, and normally open contact means also connected together, an electric power source connected between said normally closed contact means and said normally open contact means of said two changeover switches, and means operatively arranged between said forward and backward travel pedal means and the respective one of said contact means for keeping said normally closed contact means closed when said forward or backward travel pedal is not depressed, and for changing one of said contact means from a normally closed state to the normally open state when one of said pedals is depressed for supplying power to said electric motor from said electric power source.

4,560,023

POWER ASSISTED STEERING GEAR

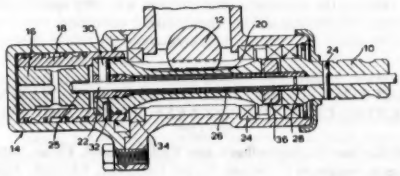
Ian G. Kirby, Hockley, England, assignor to Ford Motor Co., Dearborn, Mich.

Filed Jul. 12, 1984, Ser. No. 630,180

Claims priority, application United Kingdom, Jul. 19, 1983, 8319425

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—148 **1 Claim**



1. A power assisted steering gear having a pinion meshing with a steering rack, an input shaft and a control valve for controlling the flow of hydraulic fluid which, in use, moves the rack, the pinion and rack being positioned between the input shaft and the valve, the pinion being hollow and accommodating a torsion bar, the steering gear further comprising an input shaft extension which connects the input shaft to the valve, one end of the torsion bar being rotationally fast with respect to the input shaft and the other end being rotationally fast with respect to the pinions, the torsion bar being tubular, and the input shaft extension passing through the torsion bar.

4,560,024

AUTOMATIC RUNNING SPEED CONTROL FOR AUTOMOTIVE VEHICLES

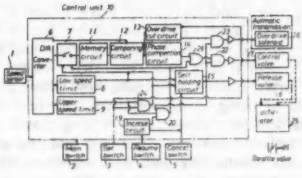
Munetaka Noda, Chiryu; Takahiko Muto, Kariya; Motoyoshi Suzuki, Kariya, and Yutaka Ninoyu, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1982, Ser. No. 430,606

Claims priority, application Japan, Oct. 8, 1981, 56-161162

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—176 **9 Claims**



1. An automatic speed control system for an automotive

vehicle having an automatic transmission including an overdrive, overdrive controller and control means for the vehicle of the type which automatically controls a throttle valve to maintain vehicle speed constant without requiring a driver's actuation of an accelerator pedal once the vehicle speed is set to a desired value comprising:

a vehicle speed sensor for detecting the actual speed of the vehicle;

a memory means including a set switch for storing the speed of the vehicle as the desired speed that is set as a set speed condition when said set switch is actuated by the driver;

a holding means for holding said set speed condition when said memory means set switch is actuated;

an adjusting means for adjusting a control signal to an actuator connected to a throttle valve to adjust the actual vehicle speed to that of said desired speed;

deceleration switch means for effecting speed reduction and having an ON and an OFF condition, wherein said control means is responsive to the ON condition of said deceleration switch means when the set speed condition exists for terminating said control signal of said adjusting means so that the vehicle is in a coasting condition for speed reduction; and

overdrive control means also responsive to the operation of said deceleration switch means to the ON condition while the vehicle is in the set speed condition for outputting an overdrive cut signal to the overdrive controller for downshifting the automatic transmission whereby speed reduction is achieved during the coasting condition.

4,560,025

PART-TIME FOUR-WHEEL DRIVE SYSTEM HAVING LOCKING CLUTCHES BETWEEN WHEEL AND AXLE SHAFT

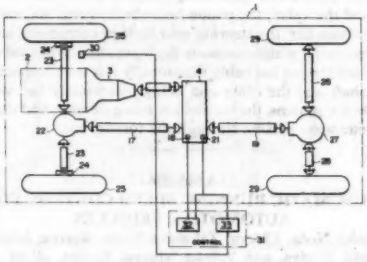
Kunihiko Suzuki, Sagamihara, and Koji Enomoto, Ebina, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 16, 1984, Ser. No. 594,906

Claims priority, application Japan, May 23, 1983, 58-90392

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—247 **13 Claims**



1. A four-wheel drive vehicle comprising:

an engine,

a pair of first wheels and a pair of second wheels,

a four-wheel drive system capable of transmitting power from said engine to said first wheels and said second wheels when said four-wheel drive system is in a four-wheel drive mode, and transmitting power from said engine only to said second wheels when said four-wheel drive system is in a two-wheel drive mode, said four-wheel drive system comprising first wheel drive means capable of being connected with said first wheels for driving said first wheels, and locking clutch means disposed between said first wheels and said first wheel drive means for connecting said first wheels with said first wheel drive means when said clutch means is engaged and disconnecting said first wheels from said first wheel drive means when said clutch means is disengaged,

rotation sensing means for detecting whether said first wheel drive means is rotating or stationary, and

indicating means, connected with said rotation sensing means, for presenting a first indication indicative of the engagement of said clutch means when said first wheel drive means is rotating.

4,560,026

PARKING SYSTEM FOR AN ARTICULATED TRICYCLE

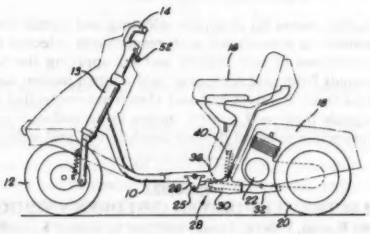
Yasuhisa Yanagisawa, and Yasuhiko Tsukiji, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,850

Claims priority, application Japan, Dec. 20, 1982, 57-191120[U]

Int. Cl.⁴ B62H *5/06*

U.S. Cl. 180—287 **6 Claims**



1. A locking system for a tricycle having a drive train, a steering column, and a body articulated about a swing shaft, comprising

a parking lever;

first locking means for selectively locking the drive train fixed relative to the body;

second locking means for selectively locking the articulated body and swing shaft;

linkage means for operatively connecting said first and second locking means to said parking lever;

a link;

a pin member slidably engaging said link;

a spring biasing said pin member relative to said link in a first direction;

a steering locking plate having holes therethrough, one of said plate and said link being mounted to the steering column and the other of said plate and said link being mounted to the body;

said parking lever actuating said link to extend said pin member for selectively engaging said holes.

4,560,027

POWER UNIT SUPPORTING STRUCTURE

Takuya Murakami, Zama, and Masaru Saotome, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 4, 1983, Ser. No. 548,569

Claims priority, application Japan, Nov. 9, 1982, 57-196203

Int. Cl.⁴ B60K *5/12*

U.S. Cl. 180—312 **5 Claims**

1. A power unit supporting structure for supporting a power unit on the body of a vehicle through the intermediary of a plurality of elastic support means,

said power unit comprising

an engine proper,

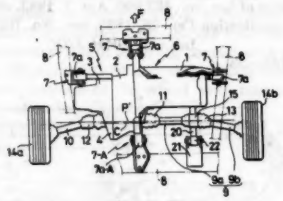
a transmission integrally connected with said engine proper through a clutch, and

a differential gear integrally connected with said transmission so as to be positioned at the front or rear side of the transmission,

said differential gear having a pair of drive shafts extending from the opposite sides thereof in a direction transversely of said vehicle body,

said supporting structure comprising

at least two first elastic support members connected to said vehicle body and said power unit supporting a differential-gear-side portion of said power unit directly



on said vehicle body at two points, said first elastic support members being separated along the direction of the rotation axis, and

at least one second elastic support member connected to said vehicle body and said power unit and supporting the portion of said power unit longitudinally opposite said differential gear directly on said vehicle body.

4,560,028

SOUND ABSORBING WALL LINING

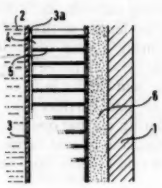
René Perret, Grenoble, France, assignor to Alsthom-Atlantique, Paris, France

Filed Apr. 8, 1985, Ser. No. 720,935

Claims priority, application France, Apr. 9, 1984, 84 05558

Int. Cl.[4] E04B *1/82*

U.S. Cl. 181—288 **11 Claims**



1. A sound absorbing wall lining having an inside surface adapted to be applied to a rigid supporting wall and an outside surface adapted to be steeped in a fluid environment, especially a liquid, traversed by acoustic waves, said lining comprising additional walls extending in a perpendicular direction from the supporting wall and forming therebetween a number of energy dissipating conduits in which an attenuating or dissipating fluid can move in a slight reciprocating motion normal to the supporting wall with a certain amount of friction, said conduits being substantially straight, with constant cross sections, and with openings at said outside surface and said inside surface, said lining further comprising a separating layer covering the outside openings of said conduits, which is permeable to acoustic waves, said lining wherein said energy dissipating conduits are filled with a dissipating fluid having a higher kinematic viscosity than the ambient fluid so that it may absorb, by laminar friction, the energy of said reciprocation motions, said separating layer being a membrane closing off the openings of the conduits to prevent the dissipating fluid from becoming diluted in the ambient fluid, said membrane being permeable to acoustic waves, and resilient, closed compression volumes being placed at the back of said conduits, in contact with the dissipating fluid, said volumes containing fluid more readily compressible than the ambient and the dissipating fluids such as to amplify said reciprocating motions of the latter fluid in response to incident acoustic waves.

4,560,029

SECURITY DEVICE

George C. Dalmaso, Polk, Pa., assignor to WGM Safety Corp., Franklin, Pa.

Filed Aug. 29, 1984, Ser. No. 645,448

Int. Cl.[4] A62B *1/14*; B65H *59/16*

U.S. Cl. 182—5 **7 Claims**

1. A security device for the attachment of a safety belt lanyard to a vertically extending safety line or the like comprising:

a frame assembly, said frame assembly comprising front and rear frame portions pivotally connected along adjacent side edges thereof,

a vertical channel formed in said rear frame portion for receiving a safety line,

a cam linkage mounted on said front frame portion, said cam linkage having cam surfaces directed into said channel,

spring means for biasing said cam linkage surfaces toward said channel,

an attachment ring connected to said cam linkage for connection of a lanyard thereto,

a latch assembly for releasably locking said front and rear frame portions in an operating position, said latch assembly including a latch plate pivotally connected at one end thereof to one of said frame portions,

a channel-shaped flange on said latch plate adapted to engage the free side edges of both frame portions in the locking position of said latch plate; and

a locking screw captively connected to the free end of said lock plate and adapted to pass through the frame portion to which the locked plate is pivotally attached and threadedly engage the other said frame portion to secure said latch plate in the locked position.

4,560,030

FOLDING LADDER

Aldo Mucelli, Musile di Piave, Italy, assignor to Metarplastic S.p.A., Musile di Piave, Italy

Filed Jul. 25, 1984, Ser. No. 634,307

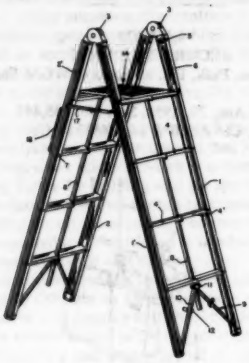
Claims priority, application Italy, May 4, 1984, 61915/84[U]

Int. Cl.[4] E06C *1/383*

U.S. Cl. 182—118 **4 Claims**

1. A folding ladder comprising two pairs of uprights (1,1', 2,2') hinged at their top and a plurality of rungs (4) connected to said uprights, characterised in that each rung (4) is formed from two equal portions (4') hinged together and is connected to the other rungs (4) at said point of mutual hinging by a rod (8,8') parallel to the uprights, and in that the rungs (4) are hinged at their ends to said uprights for passing from the working configuration of the ladder in which they are orthogonal to the uprights, to the folded configuration of the ladder in which they are substantially parallel to the uprights, each pair of uprights being provided lowerly with a stop structure (9)

constituted by two bars (10) hinged at their inner end to a block (11) in which the central rod (8,8') slides, and hinged at their outer end to the upright (1,1', 2,2'), said bars acting as struts on said block (11) when the ladder is in its working state.



4,560,031

HEIGHT ADJUSTABLE APPARATUS

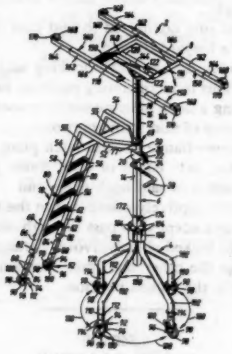
Paul L. Dixon, 6 Ravensbourne Rd., and Seymour C. Daniels, 12 Glenwood Rd., both of Catford, London, SE6, England

Filed May 7, 1985, Ser. No. 731,267

Claims priority, application United Kingdom, May 22, 1984, 8413056; Aug. 3, 1984, 8419879

Int. Cl.[4] E04G *21/14*

U.S. Cl. 182—129 **10 Claims**



1. Height adjustable apparatus for supporting goods for a person at a desired height, which apparatus comprises a base, a single elongate support member which upstands from the base, a platform member which is provided on the support member at the end of the support member remote from the base, and a ladder which is secured to the support member and which affords access to the platform member, the support member being adjustable in length so that the height of the platform member above the base can be varied to that required by a person for a particular task being undertaken, the ladder being so secured to the support member that the support member is adjustable in length whilst the ladder is secured to the support member, the ladder being so secured to the support member that the ladder is rotatable through 360° around the support member whilst the ladder is secured to the support member, and the base, the support member, the platform and the ladder being separable from one another to enable the height adjustable apparatus to be dismantled for being moved from place to place.

4,560,032

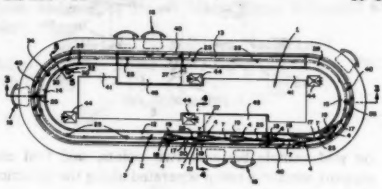
RESTAURANT FOOD DISPLAY AND SERVING SYSTEM

Shoichi Imanaka, 1737 Post St., Japan Center, San Francisco, Calif. 94115

Continuation of Ser. No. 482,900, Apr. 7, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,408

Int. Cl.[4] E04H *3/04*

U.S. Cl. 186—38 **13 Claims**



5. A restaurant food display and serving system comprising

a closed watercourse,

a counter,

a plurality of individual floating carriers for transporting objects, each of said carriers having a front-end section and a back-end section,

a means for creating a water current in said watercourse for propelling said carriers around said watercourse, and

connecting means which join said carriers in an endless succession generally spaced from one another by a selected distance,

said connecting means including a plurality of flexible discrete members each joining the front and back end sections of adjoining carriers, each discrete flexible member having a selected length so that said carriers do not touch one another during normal operation of said system, that each of said carriers can move a selected distance laterally with respect to said carrier in front and behind, and that a selected one of said carriers may manually be stopped temporarily during normal operation of said system without causing bunching of said carriers and permit the manual removal of said objects from said selected one of said carriers.

4,560,033

MULTIFUNCTION WHEELCHAIR HANDBRAKE ESPECIALLY ADAPTED FOR RAMP CLIMBING

Robert O. DeWoody, Jacksonville, and Ralph M. Hollerich, Orlando, both of Fla., assignors to Julian C. Renfro, Winter Park, Fla.

Continuation of Ser. No. 113,964, Jan. 21, 1980, abandoned, which is a continuation of Ser. No. 914,731, Jun. 12, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,565

Int. Cl.[4] B60T *1/04*

U.S. Cl. 188—2 F **6 Claims**

1. A multiposition handbrake for a wheelchair or the like comprising a housing,

a handle member pivotally mounted in said housing and having an upper portion and a lower portion, said upper portion being adapted to be grasped by the user of the lwheechair,

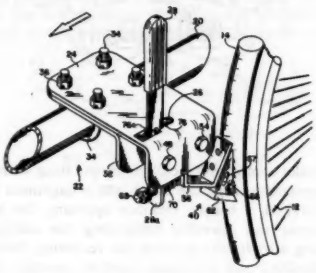
said housing being adapted to be mounted adjacent the tire of a wheel of the wheelchair and said handle having a plurality of operating positions,

a wheel-contacting assembly pivotally mounted in said housing, said wheel-contacting assembly supporting a pad adapted to be operatively disposed adjacent the tread of the tire, said pad having a plurality of pointed teeth, with said teeth possessing considerable angularity,

a lower portion of said handle member being operatively connected to said pivotally mounted wheel-contacting assembly,

said handle, when in a first position in said housing, causing no movement of the pad into contact with the tread of the tire,

the lower portion of said handle, when said handle has been moved by the user to an intermediate position in said housing, causing a corresponding movement of said wheel-contacting member such that the teeth of said pad have comparatively light touching contact with the tread of the tire, the angularity of said teeth at such time permitting forward rotation of the wheel, with rotation in the reverse direction being inhibited,



said handle, when moved to a third position in said housing, causing said pad to forcibly contact the tread of the tire, thereby firmly preventing any rotation of that wheel of the wheelchair,

said toothed pad being mounted by the use of a pair of opposed pins disposed in angled slots located in said wheel-contacting assembly, the sidewalls of said slots being disposed at non-constant radius with respect to the axis of rotation of the wheel, said pad, when its teeth are in firm engagement with the tread of the tire, being caused by wheel rotation in a certain direction to move such that its pins travel in a pad-wedging direction in their slots, thereby bringing about an intensification of braking effort.

4,560,034

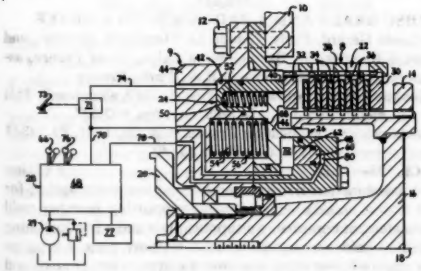
ANNULAR MULTI-PISTON BRAKE APPARATUS

Willis E. Windish, Pekin, and Marvin L. Schneider, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 577,644, filed as PCT US82/00293, Mar. 8, 1982, published as WO 83/03133, Sep. 15, 1983 & 102(e) date Mar. 8, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 747,685

Int. Cl.⁴ F16D *55/22, 65/24*

U.S. Cl. 188—72.3 **3 Claims**



1. An annular multi-piston brake apparatus having a housing with friction pack means mounted therein, the friction pack means including an annular pack engaging plate for selective holding engagement against a rotatable element, comprising:

a first brake piston reciprocally movable for directly contacting and axially urging said pack engaging plate in a preselected direction;

a second brake piston positioned within said first brake piston and being reciprocally movable for directly contacting and axially urging said pack engaging plate in the preselected direction;

a first spring positioned between the pistons and urging the first brake piston in a direction opposite the preselected direction and urging the second brake piston in the preselected direction;

a second spring reacting against the housing and urging the second brake piston in the preselected direction; and

fluid means for selectively urging the first brake piston in the preselected direction and for selectively urging the second brake piston in a direction opposite the preselected direction.

4,560,035

DISC BRAKE

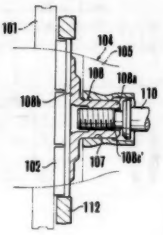
Namio Watanabe, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 491,973, May 5, 1983, abandoned. This application May 9, 1985, Ser. No. 732,894

Claims priority, application Japan, May 14, 1982, 57-70163

Int. Cl.⁴ F16D *65/18*

U.S. Cl. 188—72.8 **1 Claim**



1. A disc brake having a rotor with an axis of rotation and a circumferential periphery spaced outwardly from the axis of rotation, a pair of friction pads each arranged on an opposite side of said rotor, and a caliper comprising a saddle portion straddling the circumferential periphery of said rotor and a pair of leg portions extending inwardly from said saddle portion toward the axis of said rotor, each said leg portion is located on an opposite side of said rotor from the other said leg portion, a hollow cylinder secured to one of said leg portions and having an axis extending generally parallel to the axis of said rotor, an axially extending power screw positioned within said cylinder with the axis thereof in generally parallel relation with the axis of said cylinder, said power screw having a first end adjacent said rotor and a second end spaced axially from the first end and located more remote from said rotor, a piston having an axis generally parallel to the axis of said cylinder, said piston having an axially extending hollow part positioned within and being axially displaceable relative to said cylinder, said piston having a first end adjacent one of said friction pads and a second end spaced axially away from the one of said friction pads, the first end of said power screw extends into said hollow part of said piston, said hollow part has an interior threaded section and said power screw has an exterior threaded section extending from the first end thereof and in threaded engagement with the interior threaded section in said hollow part, said piston is arranged to press the one of said friction pads against said rotor so that due to a reaction force said caliper slides in the axial direction of said rotor and pushes the other said friction pad against the opposite side of said

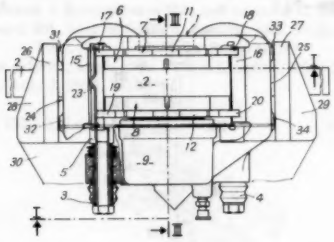
rotor, wherein the improvement comprises said piston being in sliding contact with said cylinder and being substantially free of rotational restraint by said cylinder whereby relative rotation of said piston and cylinder about the axis of rotation is possible, a load distribution plate rigidly secured to and forming one unified body with the first end of said piston and extending laterally radially outwardly from said hollow part on opposite sides thereof and engages the one of said friction pads on the opposite side of the one of said friction pads from said rotor, said load distribution plate extends parallel to the plane of said rotor and has protrudent portions formed at two end parts each located on an opposite side relative to said hollow part of said piston and projecting toward an imaginary cylindrical extension of the circumferential periphery of said rotor, and said protrudent portions being arranged to engage said saddle portion of said caliper for preventing said piston from rotating about the axis thereof and from rotating relative to said cylinder.

4,560,036

DISC BRAKE

Roger Tourneur, Pontaut Combault, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jan. 5, 1984, Ser. No. 568,478
Claims priority, application France, Jan. 12, 1983, 83 00388
Int. Cl.⁴ F16D *65/02*
U.S. Cl. 188—73.32 **5 Claims**



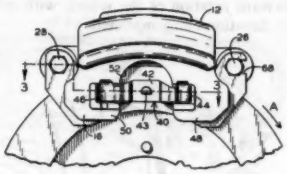
1. A disc brake of the type incorporating a sliding caliper located above a peripheral part of a brake disc and having therein a rectangular peripheral passage orifice for radially outward removal of inner and outer friction pads located in the caliper on both sides of the brake disc, the pads supported by means of respective bearing noses engaging guide edges and resting against bearing and guide faces of the caliper, a fixed support secured to a frame and supporting the caliper, two support and guide pins disposed parallel to an axis of the disc and secured to the fixed support to guide the caliper by means of corresponding bearings formed in the caliper, a control motor mounted on an inner part of the caliper and capable of displacing the inner friction pad in the direction of the outer friction pad which bears against the caliper, the caliper disposed so that a circumferential front face and a circumferential rear face of the caliper are disposed between respective circumferentially outer stops comprising a front fixed stop and a rear fixed stop disposed stationary relative to the frame, each of the fixed stops extending parallel to the axis of the brake disc and across to both sides of the disc for a length at least equal to a distance occupied by the friction pads, each of the fixed stops provided on a lateral support arm secured to a fixed lateral support disposed on an inner side of the brake disc, the pins being disposed circumferentially inwardly of the front face and rear face of the caliper, and each face of the caliper having lateral bearing heads located opposite a respective lateral support arm and extending circumferentially outwardly from the respective face to define a minimal clearance distance between the respective bearing head and lateral support arm so that circumferential movement of the caliper relative to the fixed lateral support causes one of the bearing heads to engage the respective lateral support arm.

4,560,037

SPRING FOR A DISC BRAKE

Bert A. Gumkowski, and Roger W. Oltmanns, Jr., both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 450,504, Dec. 16, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,582
Int. Cl.⁴ F16D *55/224, 65/04*
U.S. Cl. 188—73.38 **1 Claim**



1. A disc brake comprising a caliper cooperating with a pair of friction elements to urge the latter into engagement with a rotor to be braked, a torque member opposing the pair of friction elements and movably supporting the caliper, the caliper defining a hydraulic actuator for receiving fluid pressure during braking and a reaction portion opposite the hydraulic actuator and engageable with one of the pair of friction elements, and a dual purpose spring extending between the reaction portion and the one friction element to provide anti-rattle engagement and to retain the one friction element in engagement with the caliper even when the caliper is separate from the torque member, the reaction portion forming a pair of legs with an opening therebetween so that the spring extends through the opening with a pair of arms engagable respectively with the pair of legs, one of the legs engaging directly one of the arms to provide lateral loading in one direction parallel to a plane of rotation for the rotor so that when the caliper is assembled to the torque member the one friction element is biased by the spring into a substantially anti-rattle engagement therewith, the one leg of the caliper being provided with an axially tapered extension with an exterior surface forming a ramp and the one arm of the spring being provided with an arcuate end engaging directly the ramp of the axially tapered extension to generate the lateral loading for the spring and the one friction element, the axially tapered extension including an axially extending portion forming an axial shelf, and the other of the legs including an axially extending portion forming another axial shelf, the ramp and shelves defining a pocket that captures the arms of the spring to retain the one friction element in engagement with the caliper.

4,560,038

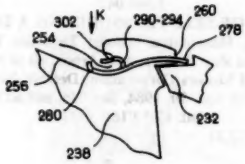
DISC BRAKE AND A PAD FOR SUCH A BRAKE

Jean-Louis Gérard, Paris; Claude Le Marchand, Domont, and Marcel Raguier, St. Barthelemy d'Anjou, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 446,071, Dec. 1, 1982, abandoned. This application Jan. 17, 1985, Ser. No. 692,327
Claims priority, application France, Nov. 30, 1981, 81 22347
Int. Cl.⁴ F16D *65/40*
U.S. Cl. 188—73.38 **9 Claims**

1. A combination friction element and anti-noise spring for use in a disc brake having a torque-supporting member, said friction element comprising a support plate and a friction lining secured to said support plate, said support plate havng an upper edge, a lower edge, and lateral edges, at least one of said lateral edges being formed with a recessed notch extending in a direction toward the other of said lateral edges and having a bottom, the notch for sliding and anchoring engagement with

a guide surface formed by an inner portion of said torque-supporting member, said upper edge being formed adjacent said notch and with an open-ended cut-out aperture extending in a direction toward the notch in said one lateral edge and comprising a spring entry portion converging in a direction toward said notch and terminating in an inner widened spring-bearing portion, said cut-out aperture defining with said notch a substantially T-shaped corner of said support plate, the T-shaped corner having a neck portion of reduced width between said inner widened spring-bearing portion and said bottom of the notch, and said anti-noise spring comprising a closed loop portion including a bearing portion and an engaging end portion and being mounted on said support plate with the loop portion encircling said neck portion of said support plate with said engaging end portion engaging the guide surface and the bearing portion engaging the widened spring-bearing portion so that the spring biases the support plate into engagement with said torque supporting member, wherein a first distance



between a junction of said entry portion and spring bearing portion and said one lateral edge of the T-shaped corner is greater than a second distance between the bottom of said notch and said junction, the bearing portion of said loop comprising an inner extension located from said engaging end portion at a distance intermediate said first and second distances, the spring being formed by an elastic wire having a substantially rectangular portion forming said loop, two long sides of which are located adjacent faces of the plate, one short side of the loop interacting with the guide surface and a second short side interacting with said spring-bearing portion, one of said long sides having a prolongation carrying at a free end a bent portion bearing on and capturing said upper edge of the plate to immobilize said prolongation axially relative to said plate, the entry portion opening into said spring bearing portion at a distance from the one lateral edge which is greater than the distance between said short sides, and the distance between said short sides being greater than the distance between the bottom of said notch and said junction.

4,560,039

DISC BRAKE ASSEMBLY SPRING

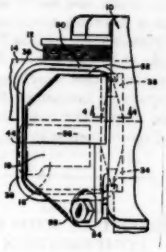
Daniel L. Bolenbaugh; John R. Wegh, both of South Bend, Ind., and Roger L. Smith, Niles, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1984, Ser. No. 609,683

Int. Cl.[4] F16D *65/02*

U.S. Cl. 188—73.45 **2 Claims**

1. A disch brake assembly comprising a torque member and a caliper assembly movably carried thereon, the torque member and the caliper assembly including at least one pair of matching slots facing each other and extending axially, a pin assembly disposed within each said matching pair of slots to retain the caliper assembly juxtapositioned the torque member and a resilient member engageable with opposite ends of the pin assembly, said torque member including a robust portion defining that one of said matching pair of slots in said torque member, torque developed during braking being transmitted directly to said robust portion by said pin assembly, said torque member further defining a flange portion extending axially from said robust portion, and of dimension smaller than said robust portion, characterized in that said torque member includes means projecting into said caliper assembly slot to oppose separation between one end of said resilient member and said pin assembly, said torque member means including a bolt with a shank extending into one of said pair of matching slots, said torque member means opposing the axial withdrawal of said pin assembly in one direction and said torque member



means further retaining said caliper assembly juxtapositioned said torque member in the event the pin assembly is displaced from said slots, and remaining spaced from said caliper assembly so long as said pin assembly remains in said pair of matching slots.

4,560,040

BRAKE DEVICE FOR BRAKING THE SAW CHAIN OF A PORTABLE MOTOR-DRIVEN CHAIN SAW

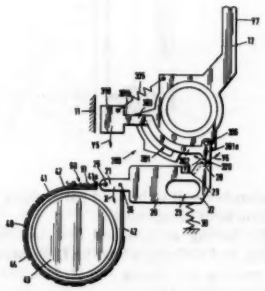
Bengt Mörner, Hovås, Sweden; Otto Vollertsen, Hamburg, and Peter Thomsen, Quickborn, both of Fed. Rep. of Germany, assignors to Sachs-Dolmar GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 458,971

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1982, 3201277; Sep. 3, 1982, 3232775

Int. Cl.[4] F16D *49/10*

U.S. Cl. 188—77 R **6 Claims**



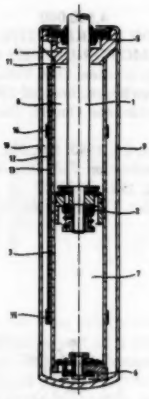
1. A brake device for braking the saw chain of a portable motor-driven chain saw, having a senser, which responds when a dangerous situation occurs, and a driving chain wheel comprising a casing, a pivotable hand guard lever which is pivotably retained on said casing and can be brought into contact with the operator's hand if the saw makes a slipping movement, a friction brake having a brake band with two ends actuated by movement of said hand lever, said friction brake being in operative connection with said hand guard lever, a drum acted upon by said friction brake connected to said driving chain wheel of said chain saw and having a safety device which, if an uncontrolled acceleration of the rotating saw chain takes place, actuates said friction brake, a brake lever having defined thereon a guideway and a recess, a lever-like device connecting said hand guard lever to said brake

lever, said brake lever having a free end with said two ends of said brake band pivotably articulated thereon at a distance from one another, actuation means for moving said brake lever when in the braking position into an angular position, while at the same time the two places of brake band articulation change their positions in relation to one another, and the brake band is applied to the brake drum; said safety device consisting of a locking lever which is pivotably mounted on said hand guard lever and bears a mass member at its free sprung end, said locking lever bearing at its end remote from the end bearing said mass member a control cam which bears against said brake lever and is so operatively connected thereto whereby said control cam can be transferred over said guideway of said brake lever into said recess therein to trigger the braking operation.

4,560,041
SHOCK ABSORBER UNIT WITH TEMPERATURE COMPENSATION

Felix Wkössner, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,588
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328347
Int. Cl.⁴ F16F 9/44
U.S. Cl. 188—278 **15 Claims**



1. A shock absorber unit to be used particularly as an insert for a compression strut comprising

a cylinder (3) having an axis and first and second ends, respectively, and defining a cavity (7, 8) therein;

a piston rod guiding and sealing unit (4, 5) adjacent said first end of said cylinder (3);

a piston unit (2) within said cavity (7, 8) dividing said cavity (7, 8) into t vo working chambers (7;8) and being provided with at least one piston passage connecting said working chambers (7; 8);

a piston rod (1) connected to said piston unit (2) within said cavity (7, 8) and extending through said guiding and sealing unit (4, 5);

a container (9) having first and second ends, respectively, adjacent said first and second ends of said cylinder (3), respectively, and surrounding said cylinder (3) such as to define a compensation chamber (10) outside said cylinder (3), said container (9) being closed at its second end by a bottom wall;

a bottom valve unit (6) adjacent said second ends of said cylinder (3) and said container (9) providing a flow passage between said cavity (7, 8) and said compensation chamber (10);

said cavity (7, 8) being filled with a damping liquid;

said compensation chamber (10) being partially filled with said damping liquid and partially filled with gas;

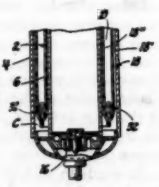
means defining at least one by-pass between said cavity (7, 8) and said compensation chamber (10), said by-pass defining a throttling flow cross-sectional area (11), said throttling flow cross-sectional area (11) being controlled by a temperature-responsive control member (12);

said temperature-responsive control member (12) being a control bar (12) arranged on the outer side of the cylinder (3) and extending substantially in the axial direction of said cylinder (3), said control bar (12) being fixed with respect to said cylinder (3) at a location (15) remote from the location of said throttling flow cross-sectional area (11) and being axially slidable with respect to said cylinder (3) in the range between said fixing location (15) and the location of said throttling flow cross-sectional area (11).

4,560,042
METHOD OF SELF-PRESSURIZING A DAMPER

Jeffrey A. Sell, Huntington Woods; Tenneille W. Capehart, Rochester, and Roy Richter, Ann Arbor, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1984, Ser. No. 605,627
Int. Cl.⁴ F16F 9/43
U.S. Cl. 188—322.21 **4 Claims**



1. In a method of forming a self-pressurized, hydraulic damper having a working cylinder in flow communication with an adjacent hydraulic fluid reservoir containing a cushioning gas pocket, said method including the principal steps of positioning a dormant gasifiable substance in the reservoir and activating the substance, after assembly of the damper, to generate at least 2 room temperature atmospheres of noncondensible gas in said pocket, the improvement comprising activating said substance by:

positioning a temporary barrier between said substance and a reagent reactive with said substance to generate said gas; and

removing said barrier such as to permit said substance and said reagent to flow together, react, generate said gas and thereby boost the pressure in said pocket.

4,560,043
LOCKUP TORQUE CONVERTER HAVING SLIP CONTROL MEANS

Takashi Murasugi, Yokohama; Yoshiro Morimoto, Yokosuka; Masaaki Suga, Yokohama, and Yasuhiro Niikura, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 25, 1983, Ser. No. 545,198
Claims priority, application Japan, Nov. 10, 1982, 57-196897
Int. Cl.⁴ F16D 43/284
U.S. Cl. 192—3.31 **6 Claims**

1. A lockup torque converter system comprising;

an input shell adapted to be driven by a prime mover,

an input member which is secured to said input shell and forms a closed fluid space with said input shell,

an output member which is disposed in said closed fluid space and forms a fluid flow circuit with said input member so that driving torque can be transmitted from said

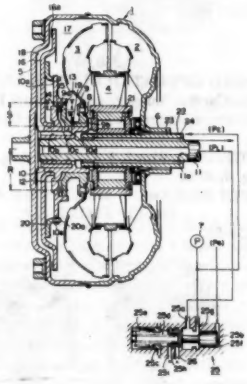
input member to said output member by the dynamic action of a fluid intervening between said input and output members,

an output shaft on which said output member is mounted,

a friction clutch, disposed in said closed space between said input shell and said output shaft, for providing a direct mechanical driving connection between said input shell and said output shaft, said friction clutch forming a lockup control chamber on one side between said input shell and said clutch and a converter chamber on the other side of said clutch, said clutch being operated by a fluid pressure difference between both fluid chambers for making and breaking the direct mechanical driving connection,

fluid pressure regulating means, fluidly connected with said lockup control chamber and said converter chamber, for regulating fluid pressures in said chambers, and

control means, disposed between said output member and said output shaft, for controlling a relative movement between said output member and said output shaft means,



said output member being drivingly connected to said output shaft through said control means, said output member being axially movable relative to said output shaft within a limited length, said output member having a pressure-receiving portion having one side receiving a fluid pressure in said lockup control chamber and the other side receiving a fluid pressure in said converter chamber so that a force resulting from a fluid pressure difference between both chambers pushes said output member axially, said output member being rotatable relative to said output shaft within a limited angle, said control means causing said output member to move axially relative to said output shaft when said output member rotates relative to said output shaft, said lockup control chamber being connected with said converter chamber through a variable orifice which is formed between said output member and said output shaft means and capable of changing the opening size of said fluid passage when said output member moves relative to said output shaft.

4,560,044

HYDRAULIC PRESSURE MODULATION DEVICE

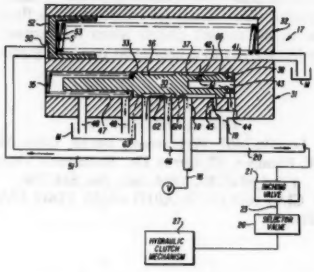
Hiroshi Nagata, Moriguchi, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Jun. 29, 1982, Ser. No. 393,504

Int. Cl.[4] B60K *41/26*; F16D *25/11*

U.S. Cl. 192—3.57 **18 Claims**

1. A hydraulic pressure modulation device adapted to be disposed between a hydraulic pressure source and a selector valve, for modulating hydraulic pressure supplied to the selector valve comprising: a cylinder; a spool fitted into the cylinder; an accumulator; an actuation chamber formed in the cylinder; a first passage openly connecting the chamber to the selector valve; a spring forcing the spool against a hydraulic pressure developed in the chamber; an auxiliary first passage openly connecting the pressure source to the selector valve; a second passage coupling the pressure source to the accumulator, for operably introducing oil from the pressure source into



the accumulator while the outlet pressure of the device increases from a first value to a second value; and a third passage coupling the accumulator to an oil tank, for operably connecting the accumulator to the oil tank substantially after the second passage is closed, said passages being formed in the cylinder and the spool.

4,560,045

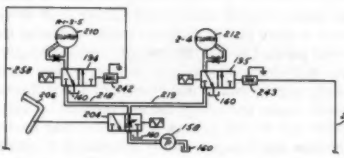
TRANSMISSION CONTROL SYSTEM FOR A TRANSMISSION HAVING INPUT SHAFTS CLUTCHED TO A POWER SOURCE

John P. Walsh, Madison Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 22, 1983, Ser. No. 487,927

Int. Cl.[4] F16D *25/10*; B60K *41/22*

U.S. Cl. 192—3.58 **15 Claims**



1. A system for controlling the operation of a vehicular transmission having first and second shafts, each shaft being associated with a first or a second group of selectable gear ratios comprising:

gearing defining multiple torque delivery paths, including multiple pairs of gears for producing multiple gear ratios;

a gear selector movable among first and second groups of gear ratio positions;

a source of pressurized hydraulic fluid;

first and second clutches for transmitting power alternatively to the first and second shafts as the respective clutches are pressurized, each clutch being associated with a first or second group of gear ratios;

first and second actuator means each movable, when connected to the fluid pressure source, from a neutral position to gear ratio producing positions for driveably connecting the gearing to the first shaft or second shaft for operation in the selected gear ratio, the first actuator means being associated with the first group of gear ratios, the second actuator means being associated with the second group of gear ratios;

first control valve means for connecting the fluid pressure

source to the first actuator means when the gear selector is moved to any of the first group of gear ratio positions;

second control valve means for connecting the fluid pressure source to the second actuator means when the gear selector is moved to any of the second of gear ratio positions;

first clutch valve means for connecting the fluid pressure source to the first clutch when the first actuator means has moved to a gear ratio producing position; and

second clutch valve means for connecting the fluid pressure source to the second clutch when the second actuator means has moved to a gear ratio producing position.

4,560,046

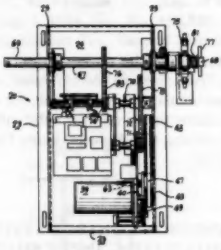
DOOR OPERATOR

Mark M. Lorello, 407 Wyleswood, Berea, Ohio 44017, and Günter F. Plamper, 90 Surrey Dr., Brunswick, Ohio 44212

Filed Mar. 15, 1984, Ser. No. 589,738

Int. Cl.[4] F16D *13/76*; A01D *69/10*; F16H *57/10*

U.S. Cl. 192—11 **7 Claims**



1. A door operator mechanism including in combination a housing having a backwall and a sidewall, a motor mounting bracket mounted on said backwall inside said housing and having first and second end portions and an intermediate portion, pivot means pivotally connecting said first end portion of said motor bracket to said housing, an electric motor carried by said motor bracket and having a drive shaft drivingly connected to a drive pulley, a driven pulley mounted for rotation on an axis parallel to said drive shaft, a belt drivingly interconnecting said drive and driven pulleys, a first spring means constantly urging said motor bracket in a first direction about said pivot means to tighten the engagement of said belt with said drive and driven pulleys, a brake bracket having a brake shoe portion and being pivotally connected to said housing, a second spring means connected to said brake bracket and constantly urging said brake shoe portion into engagement with said belt in the area of said driven pulley, a brake bracket pin secured by said brake bracket and located adjacent said electric motor whereby movement of said motor bracket in a second direction opposite to said first direction causes said motor to engage said brake bracket pin and pivot said brake bracket against the urging of said second spring means to disengage said brake shoe from said pulley and release the rotationally retarding force on said driven pulley, drive train means operably connecting said driven pulley to a rotatable jack shaft having first and second end portions, a manually rotatable sprocket mounted on said first end portion of said jack shaft and movable axially between first and second positions thereon, spring means urging said sprocket to said first position whereat it is freely rotatable relative to said jack shaft, a drive pin extending from said end portion of said jack shaft, a pivotally mounted shift lever having first and second end portions, said first end portion of said shift lever member being located adjacent said sprocket whereby pivoting of said shift lever causes said sprocket to move to said second position where said drive shoulder engages said drive pin and said jack shaft and said sprocket are rotationally locked together, a hand chain member connected to said sprocket for manually rotating the same, first and second cable guides mounted on said housing backwall outside said housing, said first and second cable guides having axes which extend generally at right angles to each other, said first cable guide being located in the general area of said motor mounting bracket and said second cable guide being located in the general area of said second end portion of said pivotally mounted shift lever member, a one piece cable having first and second end portion and an intermediate portion, said cable first end portion extending around said first cable guide and through an opening in said backwall and connected to said second end portion of said motor bracket, said cable second end portion extending around said second cable guide and through an opening in said sidewall and connected to said second end portion of said shift lever member, a chain connected to said intermediate portion of said cable by way of a ring member whereby the application of a force on said chain causes said motor bracket to move in a second direction to loosen said belt which in turn causes said brake shoe to become disengaged from said pulley and said sprocket moves to said second position to engage said drive shoulder with said drive pin.

4,560,047

SOLENOID OPERATED CLUTCH ENGAGEMENT

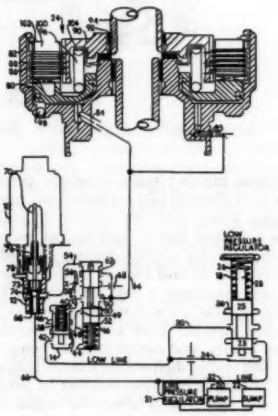
James P. McCarthy, Inkster, and Richard E. Byler, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01061, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982

PCT Filed Aug. 4, 1982, Ser. No. 425,192

Int. Cl.[4] F16D *25/14*

U.S. Cl. 192—52 **11 Claims**



1. A hydraulic control system for pressurizing and venting the cylinder of an automatic transmission clutch comprising:

a source of fluid at low pressure;

a source of fluid at higher pressure;

a first valve for communicating the low pressure source to an outlet port and for closing said communication when the pressure in the clutch cylinder reaches a first predetermined pressure;

a second valve for communicating the outlet port to the clutch cylinder when the high pressure source is connected to a control chamber of the second valve; and

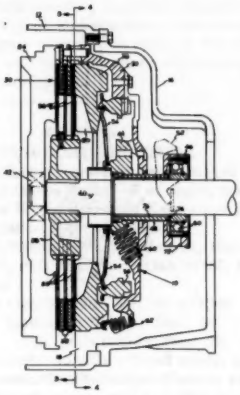
a third valve including an electrical solenoid having a valve element whose position is controlled by the state of the electrical solenoid, for opening the high pressure source to the control chamber, closing the high pressure source from the control chamber and venting the control chamber.

4,560,048

COOLING SYSTEM FOR FRICTION CLUTCHES FOR VEHICLES

Richard A. Flotow, Butler, and William H. Sink, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 30, 1983, Ser. No. 537,436
Int. Cl.[4] F16D *13/72*
U.S. Cl. 192—70.12 **12 Claims**



1. A clutch having a pressure plate, at least one friction disc with a radially outer friction surface, a liquid cooling system comprising a plurality of openings in the friction disc positioned radially inwardly of said friction surface and circumferentially spaced around the friction disc, said pressure plate having an annular surface adjacent said plurality of friction disc openings and at least one deflector extending radially from said annular surface, said at least one deflector operable to direct cooling liquid into each of said openings, means for supplying liquid to a central region of said clutch, and means operable when said pressure plate is rotating for continuously distributing said liquid radially outwardly entirely around said pressure plate annular surface, whereby cooling liquid is supplied uniformly completely around the disc and plate even when said clutch is disengaged and the disc is stationary.

4,560,049

OPERATION DEVICE FOR CLUTCH MASTER CYLINDER WITH MEANS TO ADJUST THE PLAY STROKE OF THE CLUTCH LEVER

Kouichi Uchibaba, Kawagoe; Hirotake Takahashi, Sayama, and Chiyomitsu Uchiyama, Miyoshi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,986
Int. Cl.[4] F16D *25/12, 13/75*
U.S. Cl. 192—85 R **4 Claims**

1. An operation device of a clutch master cylinder for motorcycles comprising:

a steering handle disposed on a body of a motorcycle;

a clutch master cylinder mounted on the handle and incorporating slidably therein a piston, said piston having a retracted position defined by abutment with a stopper means anchored to an inner wall of the cylinder;

lever holders;

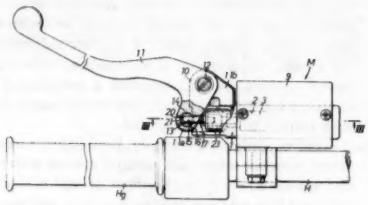
a clutch lever pivotally supported by a pivot between said lever holders and having a piston operating arm;

means for adjusting the play stroke of said clutch lever;

said piston operating arm having a bearing hole extending substantially parallel to said pivot;

a rotor turnably fitted into said bearing hole of said clutch lever and having a circular cross-section of a diameter large enough to be provided with a transverse hole therein; and

a push rod having one and other ends, said one end being inserted into said transverse hole of the rotor for connection between the push rod and the lever, the other end of the push rod being formed as a spherical convexity and coming into contact with a spherically recessed bottom portion of said piston in a swingable manner;



tool insertion holes being formed on said piston operating arm and said rotor so as to provide an access from the outside to a tip portion of the one end of the push rod inserted into the transverse hole of the rotor, said tip portion having a tool engaging groove provided thereon;

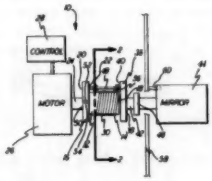
thereby enabling a tool to be inserted from the outside through said tool insertion holes to be engaged with said tool engaging groove for actuating said adjusting means.

4,560,050

SLIP CLUTCH ASSEMBLY

Charles F. deMey, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 25, 1983, Ser. No. 517,090
Int. Cl.[4] F16D *13/08*
U.S. Cl. 192—81 C **1 Claim**



1. A bidirectional torque transmitting and limiting apparatus for use in analytical instruments, in combination comprising:

a mandrel rotatable about its axis in a first direction and in a second opposite direction;

motor means fixedly attached to said mandrel for rotating said mandrel selectively in the first direction or in the second direction;

a driven member substantially coaxially disposed in axially spaced relationship with respect to said mandrel, said driven member having an axially extending protuberance disposed radially outwardly of said mandrel;

first rotation limiting means for limiting the rotational movement of said driven member in the first of its two directions of rotation about its axis;

second rotation limiting means for limiting the rotational movement of said driven member in the second of its two directions of rotation about its axis;

a helical spring mounted on said mandrel, the inner diameter of said spring when in its unstretched mode being less than the outer diameter of said mandrel for engagement therewith and the inner diameter of said spring being greater than the outer diameter of said mandrel when in its stretched mode for disengagement therewith, the axial

length of said mandrel being at least as long as the axial length of said spring;

said spring having a radially extending tang at each end thereof, one of said tangs being offset circumferentially with respect to the other of said tangs so that rotation of said mandrel in one direction causes one tang to engage one side of said protuberance and rotation of said mandrel in the opposite direction causes the other of said tangs to engage the other side of said protuberance, whereby rotation of said mandrel in its first direction or in its second direction causes said driven member to rotate until said first rotation limiting means or said second rotation limiting means, respectively, is encountered whereupon continued rotation of said mandrel a preselected distance stretches said helical spring to allow said mandrel to rotate with respect to said spring; and

said mandrel applying a constant, preselected torque to said driven member while said mandrel rotates with respect to said spring whereby engagement of said driven member with said first rotation limiting means or said second rotation limiting means is maintained.

4,560,051

HYDRAULICALLY ACTUATED CLUTCH THROW-OUT

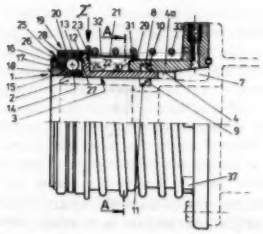
Manfred Brandenstein, Eussenheim; Roland Haas, Hofheim, both of Fed. Rep. of Germany, and Hein Hartmann, Maartensdijk, Netherlands, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,882

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 8311155[U]

Int. Cl.⁴ F15B *7/00*; F16D *25/06*

U.S. Cl. 192—98 **10 Claims**



1. In an hydraulically actuated clutch release comprising a clutch release bearing adapted to engage a clutch having a non-rotating bearing ring, a cylindrical housing and a first cylindrical sleeve defining an annular chamber, and an annular piston extending into said chamber, said annular piston being connected to said clutch release bearing, the improvement wherein said annular piston has a flange which abuts said non-rotating bearing ring on the side of the bearing ring away from said clutch, said annular piston being connected to said non-rotating bearing ring by a second cylindrical sleeve, said second cylindrical sleeve having a first portion for receiving said non-rotating bearing ring and said flange and a second portion covering the sliding surface of said annular piston, said housing being radially outwardly of said first sleeve, and further comprising a compression spring arranged on the radially outer surfaces of said second portion of said second sleeve and of said cylindrical housing, said spring abutting said cylindrical housing and urging said flange way from said housing.

4,560,052

CLUTCH RELEASE DEVICE

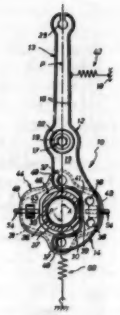
Pierre Renaud, Le Plessis-Trevise, France, assignor to Valeo, Paris, France

Filed Jun. 7, 1982, Ser. No. 385,821

Claims priority, application France, Jun. 9, 1981, 81 11272

Int. Cl.⁴ F16D *23/14*

U.S. Cl. 192—98 **24 Claims**



1. A clutch release fork for a clutch release bearing comprising means for pivotally mounting said release fork for pivotal movement generally in a plane under the action of a control arm, said release fork in its entirety having a single operating portion adapted to cooperate with a clutch release bearing, said single operating portion having an overall C-shaped configuration and being laterally open in a direction generally perpendicular to the plane of pivotal movement, means for mounting said release fork for transverse displacement between a first, assembly operation position in which said operating portion is transversely offset relative to said plane of movement and a second, operative position in which said release fork is adapted to cooperate with the clutch release bearing and pivot in said plane of pivotal movement.

4,560,053

CLUTCH RELEASE BEARING MOUNTING ASSEMBLY

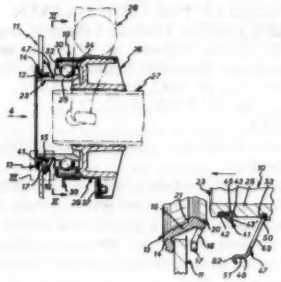
Philippe Lassiaz, Boulogne, France, assignor to Valeo, Paris, France

Filed Dec. 14, 1983, Ser. No. 561,297

Claims priority, application France, Dec. 15, 1982, 82 21054

Int. Cl.⁴ F16D *13/74*, *23/14*

U.S. Cl. 192—98 **20 Claims**



1. A pull-type clutch release bearing mounting assembly for attaching clutch release bearing to pull-type clutch disengaging means, said clutch release bearing mounting assembly comprising an actuating component having a generally radial engagement flange for coacting with the clutch disengaging means on one side of the clutch disengaging means generally

axially remote from the clutch release bearing, axial connecting means for axially connecting said actuating component to the clutch release bearing in a clutch relase direction, said actuating component including retaining means arranged on the other side of the clutch disengaging means and cooperating with said engagement flange for axially maintaining said actuating component on the clutch disengaging means, resilient biasing means disposed on the same side of the clutch disengagement means as said retaining means for constantly urging said engagement flange of said actuating component against the clutch disengaging means, said resilient biasing means being separate from said retaining means and bearing against the clutch release bearing.

4,560,054

CLUTCH DISC STRUCTURE

Katsuhiko Kayanoki; Kazuo Teramachi; Seigo Ono, all of Kyoto, and Yasuyuki Hashimoto, Osaka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Daikin Seisakusho, both of, Japan

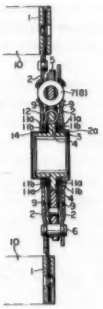
PCT No. PCT/JP82/00424, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/01663, PCT Pub. Date May 11, 1983

PCT Filed Oct. 29, 1982, Ser. No. 514,801

Claims priority, application Japan, Oct. 29, 1981, 56-16131[U]; Oct. 29, 1981, 56-16163[U]; Oct. 29, 1981, 56-161633[U]

Int. Cl.⁴ F16D *3/14*

U.S. Cl. 192—106.2 **4 Claims**



1. A clutch disc structure including a pair of disc plates holding friction discs, a hub for transmitting torque transmitted from said disc plates to an output shaft, a torque plate disposed on the outer diametral side of the hub of said output shaft, at least one torque spring disposed between said disc plates and said torque plate to serve as buffer means acting in the direction of rotation, and at least one torsion spring disposed between said torque plate and said hub to serve as buffer means acting in the direction of rotation, characterized in that at least one cylindrical bush is disposed between the sliding surfaces of said disc plates and said hub at one side of such surfaces and press-fitted in the inner periphery of one of said disc plates.

4,560,055

CLUTCH COVER ASSEMBLY WITH RETAINING LUGS FOR THE PRESSURE PLATE

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Feb. 11, 1982, Ser. No. 348,073

Claims priority, application France, Feb. 16, 1981, 81 02958

Int. Cl.⁴ F16D *13/69, 13/71*

U.S. Cl. 192—109 R **4 Claims**

1. A clutch cover assembly comprising a cover, a pressure plate, said pressure plate having a main body, an axial boss formed on an axially inner surface of said main body facing said clutch cover, straps connecting said pressure plate to said cover for rotation of said pressure plate with said cover while permitting limited axial travel of said pressure plate relative to said cover, axially acting resilient means bearing against said cover and applied against said axial boss on said pressure plate to urge said pressure plate axially away from said cover, abutment means for axially retaining said pressure plate after a predetermined axial travel of said pressure plate relative to said cover, said main body of said pressure plate substantially protruding axially beyond said abutment means away from said axially acting resilient means, said abutment means including at least one radially extending retaining lug provided on said cover and at least one transverse shoulder on said pressure

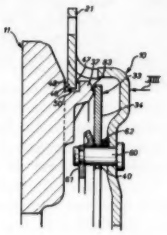


plate cooperable with said retaining lug, said transverse shoulder being in continuity with a slot in said axial boss on said pressure plate, said slot being formed in a peripheral edge of said axial boss for accomodating said retaining lug to retain said pressure plate inside said cover, said axially acting resilient means contacting said axial boss along a circumference of said cover assembly proximate to a circumference along which said retaining lug contacts said transverse shoulder, and said slot being a radially outwardly opening circumferentially extending groove having a radially inner end wall which is cooperable with the terminal part of said retaining lug to limit radial displacement of said pressure plate relative to said cover for protecting said straps against damage caused by excessive radial displacement of the pressure plate.

4,560,056

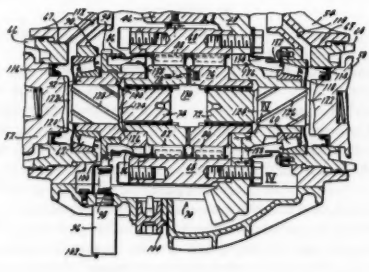
FOUR-WHEEL DRIVE CLUTCH LUBRICATION SYSTEM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1983, Ser. No. 553,205

Int. Cl.⁴ F16H *57/04*

U.S. Cl. 192—113 B **14 Claims**



1. A system for circulating lubricating oil in a clutch drive mechanism comprising:

a casing adapted to hold a reserve volume of oil, defining a space in which the drive mechanism is located, having a radially directed oil passage;

an axleshaft rotatably supported on the casing extending outward from the casing, having an oil pumping portion located within the casing that includes multiple helical grooves formed on the outer surface of the axleshaft, adapted to pump oil along the axleshaft as it rotates;

a first chamber communicating with the casing oil passage surrounding the axleshaft and located adjacent the pumping portion;

a bearing fitted within the casing; and

a member mounted for rotation about the axis of the axleshaft for rotation relative to the axleshaft, extending into and passing through the oil reserve within the casing as said member rotates, having a first surface on which the bearing is mounted and a second surface on which the pumping portion of the axleshaft is journalled, whereby oil is pumped axially along the pumping portion from the first chamber and lubricates the surface on which the pumping portion is journalled.

4,560,057

PACKET HANDLING APPARATUS

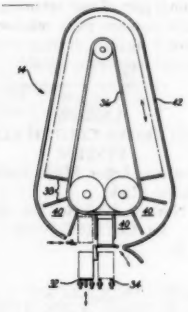
Barry G. Applegate, London; David C. M. Carter, and Frank Heybourn, both of Milton Keynes, all of England, assignors to Molins Limited, London, England

Filed Nov. 20, 1981, Ser. No. 323,481

Claims priority, application United Kingdom, Nov. 21, 1980, 8037442

Int. Cl.⁴ B65G *1/00*

U.S. Cl. 198—347 **14 Claims**



11. An article handling apparatus including an article delivery station; an article receiving station; first conveyor means for moving a stream of articles on a first path extending between said delivery station and said receiving station; second conveyor means disposed side-by-side and in parallel with a portion of said first conveyor means for moving articles in series; a reservoir disposed in operative relationship with said first and second conveyor means for storing articles, including means forming article storage compartments moveable along a second path, at least a portion of which extends transversely above said first and second conveyor means; diverting means for selectively diverting articles transversely from said first conveyor means into said reservoir; dispensing means for selectively dispensing articles from said reservoir onto said second conveyor means; and means for merging articles on said second conveyor means with articles on said first conveyor means downstream of said reservoir.

4,560,058

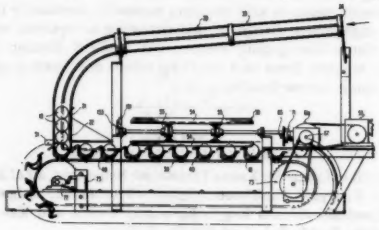
CONTAINER HANDLING SYSTEM

Frank L. Enochs, Irving, Tex., and Michael B. Kohler, Richland, Wash., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Jul. 20, 1979, Ser. No. 59,176

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—426 **7 Claims**



1. A container handling system for distributing a plurality of tubular containers from a source to a plurality of receivers comprising:

(a) a holding chute for holding and discharging tubular containers;

(b) an indexing conveyor positioned to receive containers from the holding chute and align a plurality of containers for delivery;

(c) a plurality of recivers positioned adjacent the conveyor to receive containers from said conveyor;

(d) a plurality of container carriers positioned on the conveyor at spacing corresponding to the spacing between said recivers;

(e) said container carriers being configured to individually receive and carry a container dispensed thereto from said chute, said carriers having means for preventing containers from being dispensed to a position between adjacent carriers and for retaining a subsequent container in position for dispensing into a subsequent carrier;

(f) means for intermittently moving said conveyor to pass a plurality of said carriers past the discharge of said holding chute to position a container discharged from said holding chute in the respective carriers;

(g) means for stopping said conveyor in a position in which a plurality of said carriers holding a container are adjacent a corresponding plurality of said receivers; and

(h) means for moving a plurality of said containers from their carriers to said respective receivers.

4,560,059

CONVEYOR TROUGH CONSTRUCTION

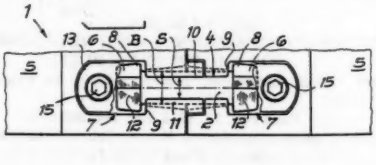
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach and Braun Industrieanlagen, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,309

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307646

Int. Cl.⁴ B65G *19/28*

U.S. Cl. 198—735 **3 Claims**



1. A conveyor trough construction comprising:

two adjacent trough parts (5,5) having a joint area therebetween, each trough part having an upper inner section (3)

with a bolt receiver (4) defined in each trough part extending across said joint area and an access slot (10) which is smaller in width than said receiver, communicating said receiver with said upper inner section of said trough parts, said receiver having an enlarged end portion (7) in each trough part communicating with said upper inner section, and a central portion connected between said end portions and extending across said joint area and communicating with said access slot, said trough parts each having a contact shoulder (9) between said end portion and said central portion;

a bolt (2) disposed in said receiver (4) for holding said trough parts together, said bolt having a shank (11) of substantially rectangular cross-section with a wide side (B) which is wider than said slot (10) and a narrow side (A) which is narrower than said slot, said shank being disposed in said central portion of said receiver and being insertable into said central portion through said slot with said narrow side extending across said slot and being rotatable through 90° in said central portion so that said wide side is parallel to the width of said slot, said bolt including an enlarged contact rim (8) connected to each end of said shank (11), each contact rim being disposed in one of said end portions (7) of said receiver and being engageable against said contact shoulder (9) of each trough part (5), each contact rim having an arresting recess (12) having a segment shape and extending in the direction of said wide side of said bolt shank, each contact rim being insertable into each end portion of said receiver and being rotatable with said rotation of said shank to bring said arresting recesses into a position facing said slot in said upper inner section (3) of each trough part; and

at least one closing plate (13) secured to said upper inner section for covering said slot (10) and said end portions (7), said closing plate having an enlarged end for covering each end portion and having an outer surface flush with said upper inner section of said trough parts, said closing plate having a projection (14) extending into each arresting recess (12) of each contact rim (8) for preventing rotation of said bolt in said receiver.

4,560,060

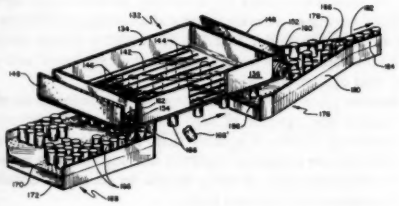
VACUUM BELT CONVEYOR

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Continuation-in-part of Ser. No. 583,694, Feb. 27, 1984, which is a continuation-in-part of Ser. No. 543,271, Oct. 17, 1983, which is a continuation-in-part of Ser. No. 514,590, Jul. 18, 1983. This application Mar. 26, 1984, Ser. No. 593,267

Int. Cl.[4] B65G *47/91*

U.S. Cl. 198—803.5 **8 Claims**



1. A vacuum transfer conveyor apparatus for transferring selected vertically-arranged containers in random mass from a first station to a second station spaced from the first station, said apparatus comprising:

a vacuum plenum having a wall, with an inner surface and an outer surface, spaced above the first station a distance slightly greater than the height of the containers and extending to the second station;

means for drawing a constant maximum vacuum in said plenum which is uniform from said first station to said second station;

a plurality of spaced air jet openings extending through said plenum wall arranged in parallel rows extending from above the first station to above the second station said jet openings in each row adjacent said first station being larger in diameter than the rest of said jet openings to draw a first greater CFM and air flow velocity at said first station to lift the containers from said first station and to hold each container against said transfer belt and said rest of said jet openings being effective to draw a second lesser CFM and air flow velocity which is just sufficient to continue to hold and transfer containers to said second station;

a vacuum transfer belt having a reach mounted for movement along said outer surface of said plenum wall, said belt having a plurality of spaced elongated slots arranged in parallel rows corresponding to and overlaying at least some of said rows of jet openings, said slots being of sufficient length to expose a maximum of two jet openings at one time and being spaced apart along each row a distance equal to the length of said slots along each row;

a longitudinal rib on the inside surface of said transfer belt adjacent each side edge thereof;

a longitudinal groove on the outer surface of said plenum wall adjacent each side edge thereof for receiving said respective ribs to form an air seal between said edge of said transfer belt and said plenum wall; and

means for moving said transfer belt across said plenum surface from a position above the first station to the second station.

4,560,061

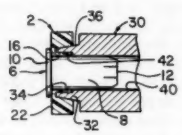
POWDER CHARGE FEED STRIP

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Hudson, N.H.

Filed Sep. 13, 1983, Ser. No. 531,654

Int. Cl.[4] F42B *37/00*

U.S. Cl. 206—3 **12 Claims**



1. A powder charge feed strip for introducing explosive powder cartridges into an explosive powder-actuated fastener-driving tool, comprising:

an elongated body made of a thermoplastic material having first and second oppositely facing flat face surfaces and first and second oppositely facing side edge surface extending between said face surfaces;

a plurality of circular holes in said elongated body extending through said first and second face surfaces, said holes being aligned lengthwise of said elongated body; and

a plurality of annular grooves in said first face surface concentrically surrounding and spaced from said holes and coacting with said holes so as to define sleeve portions in said elongated body which act as cartridge-receiving chambers, said grooves being shaped in cross-section so that said elongated body has tapered circularly extending surfaces in spaced and surrounding relationship with said sleeve portions; and

explosive powder cartridges disposed in said holes with the rims of said cartridges engaged with said elongated body on the side opposite said first face surface, said holes having a diameter slightly less than the outside diameter of

the casings of said cartridges adjacent said rims, so that said sleeve portions tightly surround and grip the casings of said cartridges adjacent said rims.

4,560,062

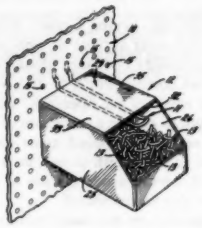
METHOD AND APPARATUS FOR SUPPORTING A DISPLAY CARTON

Stanley C. Valiulis, Rockford, Ill., assignor to Southern Imperial, Inc., Rockford, Ill.

Filed Dec. 24, 1984, Ser. No. 685,455

Int. Cl.[4] B65D *5/44, 33/14*

U.S. Cl. 206—44 R **4 Claims**



1. The combination of:

A. an upright display panel having inner and outer faces and having horizontally spaced holes extending between said inner and outer faces;

B. an outwardly extending hanger having two horizontally spaced arms connected at their outer ends and defining a generally U-shaped configuration when viewed from above, said hanger including means on the inner ends of said arms and projecting through said holes to attach said hanger to said panel; and

C. a carton of rectangular cross-section for holding and displaying merchandise, said carton having two upright side walls, having upper and lower walls and having inner and outer walls, the outer end of the upper wall being spaced inwardly by a substantial distance from the upper end of said outer wall to leave a merchandise display and access opening at the upper and outer portion of said carton, said upper wall being secured against being opened relative to said side walls, and there being a vertically narrow gap between the lower face of said upper wall and the upper end of said inner wall,

said combination being characterized in that said hanger arms extend outwardly through said gap in overlying relation with the upper end of said inner wall and in underlying engagement with the lower face of said upper wall to support said carton on said hanger in outwardly extending relation from said panel.

4,560,063

PAPER CONTAINER FOR HOT LIQUIDS AND METHOD AND APPARATUS FOR MAKING SAME

Berthold Müller, Süssen, Fed. Rep. of Germany, assignor to Michael Horauf Maschinenfabrik GmbH & Co. KG, Sussen, Fed. Rep. of Germany

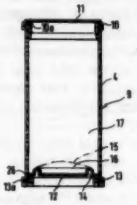
Filed May 22, 1984, Ser. No. 613,037

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322977

Int. Cl.[4] B65D *3/10*

U.S. Cl. 229—5.5 **3 Claims**

1. In a paper container of the type which receives liquids in a hot state, the container comprising a wound paper jacket, a separate paper bottom set into said jacket, a support surface for receiving a removable cover, and a deformation area which is deformable to accommodate a reduction in volume of the closed container during cooling of the liquid, the improvement wherein said bottom having a wall thickness which is approximately one-third that of said jacket to facilitate inward deformation of said bottom, said deformation area including a circumferential groove formed in said bottom such that the portion of the bottom encompassed by said groove is inwardly



deformable during cooling of the liquid to reduce the internal volume of the container by approximately 3 to 6 percent of its nominal volume.

4,560,064

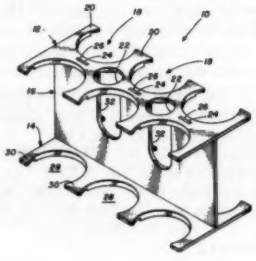
CARRIER FOR CANS

Bertel R. Peterson, San Juan Capistrano, and Vincent E. Fortuna, Huntington Beach, both of Calif., assignors to Vercon, Inc., Dallas, Tex.

Filed Jul. 30, 1984, Ser. No. 635,998

Int. Cl.[4] B65D *85/30, 75/00*

U.S. Cl. 206—159 **6 Claims**



1. An improved carrier for a can that includes a cylindrical can body having an exterior, a top and a bottom attached to the ends of said can body, said top including a flange portion projecting radially outwardly beyond the exterior of said can body, said carrier comprising:

a bottom plate member including arcuate recesses sized to receive the exterior of said can body, each said recess including an arc of greater than 180° forming a pair of resilient can engaging fingers in said bottom plate member for retaining said can body therein by partially encircling the exterior of said can body;

a top plate member including arcuate recesses sized to receive the exterior of said can body and engageable with said flange portion for supporting said can, said recesses including an arc of greater than 180° forming a pair of resilient can engaging fingers in said top plate member for retaining said can body therein by partially encircling said can body below said flange portion; and,

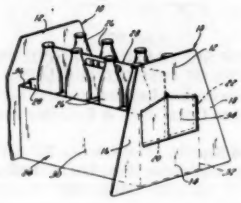
a spacer member is attached to and extends between said top and bottom plate members for holding the recesses in said plate members in alignment.

4,560,065

CARTON STABILIZER

Jerome F. Sheldon, Milwaukee, Wis., assignor to Jerome F. Sheldon Inc., West Allis, Wis.

Filed Aug. 6, 1984, Ser. No. 637,845
Int. Cl.[4] B65D *65/00*
U.S. Cl. 206—427 **9 Claims**



1. A device for stabilizing an open-top carton having a center panel, two side panels, and first and second end panels and resting on a supporting surface, comprising:

a substantially flat member adapted to be installed on one of said end panels so as to support said carton against tipping, wherein the height of said flat member is greater than the height of said end panel, said flat member including:

a. a bottom web portion which is wider than the width of said respective end panel and which is adapted to contact the outer surface of said respective end panel and to rest on said supporting surface when said stabilizing device is installed on said carton;

b. a top web portion which is adapted to lie above said end panel when said stabilizing device is installed on said carton;

c. first and second side web portions which connect said top web portion to said bottom web portion;

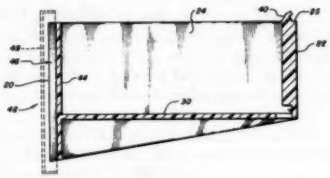
d. at least two tabs projecting downward from said top web portion and lying between said first and second side web portions, said tabs being adapted to enter into the open top of said carton so as to contact the inner surface of said end panel of said carton and so as to straddle said center panel.

4,560,066

ACCESSORY TRAY FOR PORTABLE COMPUTER

Michael Croteau, 69 Left Derryfield Rd., Derry, N.H. 03838

Filed Apr. 19, 1984, Ser. No. 601,855
Int. Cl.[4] B65D *21/00*
U.S. Cl. 206—501 **4 Claims**



1. In combination, an accessory tray for and engageable with a portable computer having a separate keyboard, said accessory tray adapted for carrying with said portable computer and keyboard as a unitary structure, said combination comprising:

a generally rectangular tray having front, back, bottom and side walls wherein the height of the front wall is greater than the height of the back wall and wherein the bottom edge of the side walls defines an angular plane which is at an acute angle to the plane defined by the top of the side walls;

a portable computer having a tray-abutting surface;

a first clasping means for securing the tray to the computer with the top of the side walls contacting the tray-abutting surface;

a keyboard having a tray-abutting surface adapted to extend in the interlocked position of the structure at an angle which is complementary to the angle of the tray angular plane; and

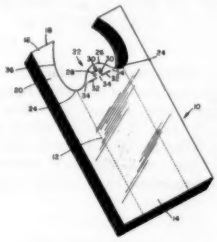
a second clasping means for securing the tray to the keyboard on the bottom of the side walls contacting the tray.

4,560,067

THERMOPLASTIC BAG PACK

George J. Reimann, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 25, 1984, Ser. No. 634,089
Int. Cl.[4] B65D *1/34, 6/04*
U.S. Cl. 206—554 **9 Claims**



1. A bag pack comprising a plurality of stacked thermoplastic film bag structures, each bag comprising a front and rear bag wall and an open mouth portion, said open mouth portion being characterized by having handles which are integral extensions of said walls, said handles being located at opposite ends of said mouth portion; the superimposed lines defined by both film edges of said bag mouth portion when the bag is in its lay-flat position are a series of compound curves including (a) stress relief curves at opposite ends of said bag mouth, said stress relief curves opening or facing in the direction of the handle end of the bag and (b) a curve intermediate said stress relief curves, said curve being generally of the same but opposite amplitude of said stress relief curves; located within the area beneath said (b) curve are: (i) at least one orifice to accommodate physical suspension of said bag pack from a suspension means to be placed within said orifice, said orifice being of the type which in the absence of reinforcement tends to distort or enlarge under the weight of the bag pack; (ii) at least one melt-bonded means fastening all of said bags structures together, said melt-bonded means being located at a point below and closely adjacent to said orifice providing rigidity and reinforcement thereto; and (iii) located below and closely adjacent to said melt-bonded means and above the point of maximum amplitude of said stress relief curves a line of preweakening in said film, said line of preweakening adapted to accommodate, in cooperation with said orifice and bonding means, tear-off of individual bags structure from said bag pack.

4,560,068

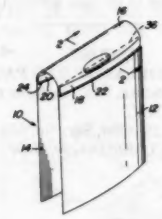
DOUBLE-POCKET PAD OF BAGS

Hercules Membrino, 280 Paoli Pike, Malvern, Pa. 19355

Filed Jan. 4, 1985, Ser. No. 688,801
Int. Cl.[4] B65D *30/22, 85/62*
U.S. Cl. 206—554 **6 Claims**

1. A pad of plastic bags comprising a plurality of bag units overlying each other, each bag unit comprising a pair of pockets each of which has a front wall, a rear wall and an open mouth, said pockets being linearly spaced from each other by a selvage portion between their respective mouths, said sel-

vage portion being formed by integral extensions of the rear walls of said pockets, and the front walls of said pockets being integral extensions of their respective rear walls, said front walls being spaced at their upper edges from said selvage portion to form the respective mouths, the mouth of one of said pockets being only on the upper surface of said unit and the mouth of the other of said pockets being only on the lower



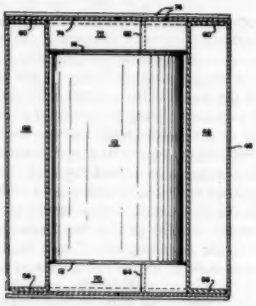
surface of said unit when said unit is laid flat in a horizontal position, the selvage portions of said units being connected to each other to form a base portion, said base portion being overfoldable to form the pad wherein, when overfolded, the mouths of all the pockets in the pad face in the same direction, and spaced parallel lines of weakness in said base portion to permit removal of individual bag-forming pockets from said base portion.

4,560,069

PACKAGE FOR HAZARDOUS MATERIALS

B. Kenneth Simon, 40 Woodhaven Dr., Pittsburgh, Pa. 15228

Filed May 2, 1985, Ser. No. 729,810
Int. Cl.[4] B65D *81/26, 81/04, 81/15, 85/84*
U.S. Cl. 206—591 **18 Claims**



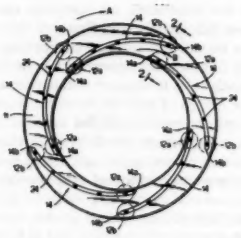
13. A package assembly comprising an outer fiberboard box having box sidewalls, an inner fiberboard insert element, said inner fiberboard insert element having insert element sidewalls, foldable flaps at the top and bottom of said insert element sidewalls, said flaps folded outwardly to provide top and bottom spacer braces to brace said insert element within said fiberboard box, partial cuts in upper and lower corners of said insert element, said partial cuts forming flexible upper and lower eaves within said insert element by inverting the corner of said insert element at said cuts, a can within said insert element, said can resting between said upper and lower eaves to provide a buffer space between all sides of said can and said outer fiberboard box, a bottle disposed within said can but out of contact therewith, a plurality of absorbent elements each comprising a resinous foam material disposed between said can and said bottle, said absorbent elements including a hollow cylindrical core element for surrounding and holding the sides of said bottle, a lower cylindrical disc element disposed beneath said core element, an upper cylindrical disc element disposed above said core element, a lower spacer comprising a material other than said resinous foam material disposed between said bottle and said lower cylindrical disc element, and an upper spacer comprising a material other than said resinous foam material disposed between said bottle and said upper cylindrical spacer element.

4,560,070

DEVICE FOR SEPARATION OF SPRUES FROM MOLDED PIECES OF DIFFERENT SHAPES AND SIZES

Oreste Cribiu', Turate, and Leonardo Cribiu', Saronno, both of Italy, assignors to Crizaf di O. & L. Cribiu' S.n.c., Saronno, Italy

Filed Sep. 30, 1983, Ser. No. 537,435
Claims priority, application Italy, Oct. 6, 1982, 23637 A/82
Int. Cl.[4] B07B *1/22*
U.S. Cl. 209—664 **5 Claims**



1. A device for separating first molded pieces from second molded pieces, said devices comprising a rotatable drum comprising two axially spaced end rings defining end openings through which the molded pieces are loaded into the drum, a plurality of sets of parallel rollers extending between said end rings, the rollers in each set being circumferentially spaced from each other to provide openings through which one of said first or second molded pieces can be ejected, each of said sets of rollers comprising a leading roller located adjacent the outer circumference of said end rings and a trailing roller located adjacent the inner circumference of said end rings, the respective leading and trailing rollers of adjacent sets of rollers being spaced radially to define a radial gap therebetween through which said one of said first and second pieces can also be ejected, and means for supporting the rollers of each set of rollers for adjustment towards and away from each other in a circumferential direction to adjust said openings and for adjusting the circumferential position of the leading roller of one set relative to the trailing roller of the adjacent set, adjustment of the circumferential position of the leading roller of one set relative to the circumferential position of the trailing roller of an adjacent set effecting adjustment of the radial gap therebetween.

4,560,071

DISPLAY DEVICES FOR DISPLAYING FISHING POLES AND FISHING REELS

Jack G. Downing, Cincinnati, Ohio; Erwin W. Dewald, Dry Ridge, Ky., and David Hayes, Harrison, Ind., assignors to Downing Displays, Inc., Cincinnati, Ohio

Filed Jan. 27, 1984, Ser. No. 574,333
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—70.8 **3 Claims**

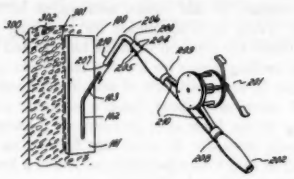
1. A device for displaying a fishing pole comprising

a pin,

means for supporting the pin, said pin is generally straight

and extends generally outwardly and upwardly at an acute angle from said support means and

a fishing pole having a handle portion and a mounting portion, the handle portion having a fishing reel mounted



thereon and the mounting portion having an angular downwardly bent tube, the angular downwardly bent tube having an aperture for receiving the pin to removably mount thereon said fishing pole for displaying said fishing pole and said fishing reel.

4,560,072

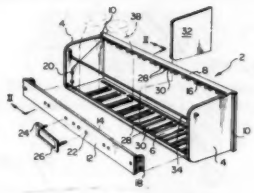
DISPLAY AND STORAGE RACK

Alfred A. Burrell, 10223-133th St., Edmonton, Alberta, Canada

Filed Feb. 24, 1983, Ser. No. 469,308

Int. Cl.⁴ A47F *5/08*

U.S. Cl. 211—75 **16 Claims**



1. A rack for holding objects for storage or display comprising spaced planar sides normally vertically oriented, the sides of each having top, bottom, front and back edges, a rectangular base panel extending between the sides along the length of their bottom edges, a rectangular top panel extending between the sides along a portion of the length of their top edges from the back, the base and top panels being normally oriented substantially horizontally, a planar rectangular front panel normally vertically oriented, extending between the sides along a portion of the length of their front edges from the bottom, the rack having an open back, the back edges of the sides having outwardly, oppositely extending flanges for mounting the rack the top edge of the front panel, the front edge of the top panel and the sides defining a sufficient opening to the interior of the rack from the front or top for objects to be manually placed therein or removed therefrom.

4,560,073

RACK WITH DETACHABLE DIVIDERS

Clarence J. King, Ludington, Mich., assignor to Straits Steel & Wire Co., Ludington, Mich.

Filed Nov. 25, 1983, Ser. No. 554,892

Int. Cl.⁴ A47F *5/01*

U.S. Cl. 211—184 **18 Claims**

1. A rack having a frame including a pair of parallel anchor rails rigidly interconnected by a pair of parallel cross members; an article support having a pair of elongated parallel feet each foot being seated on both of said cross members, said feet being spaced the same distance as said rails and being seated adjacent said rails; a hook element on each of said feet extending beneath the adjacent rail for holding said article support against displacement from said frame in a vertical direction; detent means on one of said hook elements engaging the side of the adjacent rail opposite from the foot and detachably clamping

the article support to the rail against movement parallel to said cross members.

4,560,074

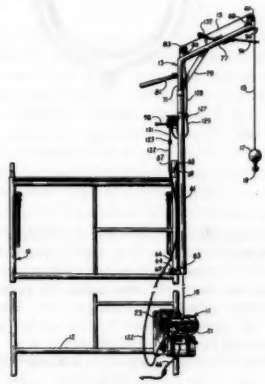
SCAFFOLD MOUNTED HOIST

Charles E. Manning, 1407 Hickory St., Crossett, Ark. 71635

Continuation of Ser. No. 452,795, Dec. 23, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 624,134

Int. Cl.⁴ B66C *13/18, 23/02*

U.S. Cl. 212—152 **7 Claims**



1. A scaffold mountable hoist comprising

a winch assembly including

a scaffold mounting bracket for temporarily mounting said assembly to a lower portion of an assembled scaffold structure,

a reversible electric motor mounted to said bracket,

a cable drum rotably secured to said bracket,

a worm drive mechanism attached to drive said drum from said motor, and

a cable secured to said drum,

a boom assembly separate from said winch assembly including

a mast element having at its lower end a member shaped to engage and to lock on a structural element of said scaffold and at its upper end a tube adapted to fit over the top of a scaffold column thereby providing means for temporarily securing said mast element in upright position to an upper portion of an assembled scaffold structure,

a boom having a vertical tube section and a boom element portion attached thereto at an angle rotatably secured at the top of said mast element for rotation about a vertical axis,

first pulley means located near the junction of said mast and boom for guiding a portion of the length of said cable upwardly to the inner end of said boom substantially colinear with the axis of rotation of said boom, said cable passing from said drum through the space

between said winch assembly and said boom and through said vertical tube section, and

second pulley means for guiding a portion of the length of said cable from the inner end of said boom to near the outer end thereof, and

a controller unit electrically connected to said motor for causing it to operate in forward or reverse direction under manual control.

4,560,075

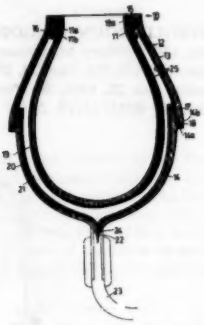
VACUUM FLASK CONSTRUCTION

Fu-San Lu, No. 80, La. 2, Sec. 1, An Her Rd., Tainan, Taiwan

Filed Jun. 8, 1984, Ser. No. 618,623

Int. Cl.⁴ B65D *6/10*

U.S. Cl. 215—13 R **2 Claims**



1. A vacuum flask comprising: a container made of molded plastic material having a first screw thread formation at the outer rim of its open end, a jacket disposed around the wall of said container, the jacket including an upper portion and a lower portion which are sealingly and threadedly coupled together, the upper portion having an inwardly and downwardly curved rim which is provided with a second thread formation in a sealing engagement with said first thread formation, the wall of the container and the jacket defining a vacuumized space, and a thin metal layer being superimposed on the inner side of the jacket or on the outer side of the wall of the container respectively.

4,560,076

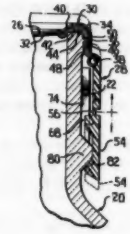
TAMPER INDICATING BAND FOR USE IN LOW RISE CAM-OFF APPLICATION

Elmer J. Boik, Lombard, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Apr. 17, 1984, Ser. No. 601,209

Int. Cl.⁴ B65D *41/34*

U.S. Cl. 215—252 **9 Claims**



1. A tamper indicating member for use with a closure removable by turning, said tamper indicating member in its as formed state being generally in the form of a sleeve and comprising an upper band and a lower band, rupturable bridges extending axially between and releasably interconnecting said upper band and said lower band, and means on said upper band and said lower band for axially separating said bands in response to rotation of said bands, said means including said upper band having securing means for attaching said upper band to a closure for rotation with the closure and said lower band having locking means for locking said lower and relative to a container to resist rotation of said lower band with said upper band when said upper hand is rotated, said locking means being in the form of a plurality of circumferentially spaced radially inwardly directed lugs formed on a radially inner surface of said lower band spaced above a lower end of said lower band, and each of said lugs having a circumferentially facing cam surface for urging said lower band axially away from said upper band in response to a rotary force in a closure releasing direction on said lower band.

4,560,077

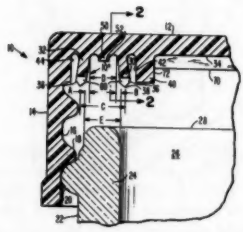
PLASTIC CLOSURE CAP

Herbert V. Dutt, Sarasota, Fla., assignor to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Sep. 25, 1984, Ser. No. 654,084

Int. Cl.⁴ B65D *53/00*

U.S. Cl. 215—307 **16 Claims**



13. A closure cap for use with a container, said closure cap comprising:

a generally circular cap top having a generally planar outer surface and an inner surface;

a generally cylindrical side wall joined at a first end to a peripheral portion of said cap top and including means for securing said closure cap to a container;

a pair of spaced inner and outer, downwardly extending sealing flanges, each of said sealing flanges being joined at a first end to said inner surface of said cap top, said inner and outer sealing flanges each having a free end with said free ends being spaced from each other at a distance greater than the spacing of said first ends of said sealing flanges;

a plurality of vent slots in each of said sealing flanges; and,

inner and outer sealing flange back up abutment surfaces, said inner and outer abutment surfaces being engageable by said free ends of said inner and outer sealing flanges, respectively, to limit deflection of said inner and outer sealing flanges when said closure cap is secured to a container.

4,560,078

CASE WITH ROTARY TELESCOPIC SECTIONS

Joseph E. Dubuisson, 241 Brenda Dr., Shreveport, La. 71115

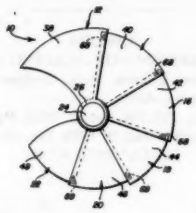
Filed Sep. 21, 1984, Ser. No. 653,076

Int. Cl.⁴ B65D *21/02*; A47B *87/02*

U.S. Cl. 220—4 C **9 Claims**

1. A structure comprising a plurality of stacked trays each having a tray portion and a hub portion extending from the

tray portion for rotationally journalling the tray about an axis common to all of the trays, the trays being mounted for rotary movement between a retracted position in which they are superimposed one above another and an extended position in which the trays occupy adjacent angular positions, the structure including interengaging means between adjacent trays for providing sequential rotary movement of the trays effective to fan the trays out into the extended position responsive to rotation of the uppermost tray of the stack from the retracted position, wherein the tray portion of each tray is shaped substantially as a segment of a circle, the hub portion is located at the apex of the circle, each tray has a depending peripheral skirt opposite the hub portion, and wherein the trays are of successively smaller diameter from the uppermost tray down the plurality of trays so that the trays telescope into a nested configuration in the retracted position thereof.

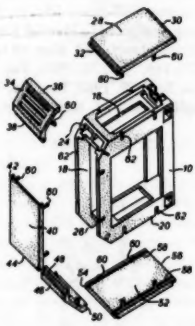


4,560,079

EQUIPMENT ENCLOSURE

Michael J. Eddleston, and Christopher Hume, both of Glasgow, Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 2, 1984, Ser. No. 576,247
Int. Cl.⁴ B65D *7/42, 7/00*
U.S. Cl. 220—4 R **28 Claims**



1. An equipment enclosure wherein a plurality of covers are assembled around a frame, said enclosure comprising:

a first edge cover for covering a first face of said frame, said first edge cover in turn comprising a fixing lug there-beneath for removable insertion into a matching recess on a second face of said frame, said second face of said frame being contiguous with said first face of said frame, for holding said first edge cover onto said first face, and said first edge cover further comprising a groove parallel to said second face along the line of contiguity between said first and second faces;

a sliding cover in turn comprising a tongue for insertion into said groove during the assembly of said enclosure for said sliding cover to slide over said second face of said frame to trap said lug in said recess to prevent the removal of said first edge cover from said first face and for said first edge cover to secure said sliding cover on said second face by means of said groove; and

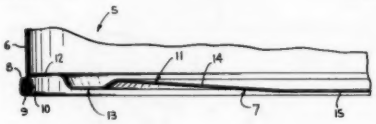
a back cover, affixable on a third face of said frame, for engaging said sliding cover to prevent said sliding cover being slid out from said groove.

4,560,080

REINFORCED STRUCTURE FOR STEEL ENDS OF CYLINDRICAL SHIPPING CONTAINERS

John K. Shepard, Bolingbrook, and Carl Roberson, Downers Grove, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 10, 1981, Ser. No. 252,718
Int. Cl.⁴ B65D *8/08, 8/18*
U.S. Cl. 220—67 **4 Claims**



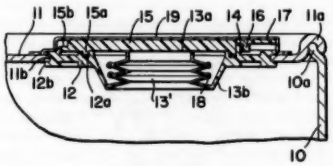
1. A metal end for a shipping container, said end being circular in outline and having a peripheral flange portion for securement to a container body by the formation of a seam, said flange portion including an axially projecting bead including a generally cylindrical radially inner wall, and end panel integrally connected to an upper edge of said inner wall, said end panel in its unstressed state sloping radially inwardly and axially outwardly, and said end panel being reinforced by an integral axially downwardly and outwardly projecting annular rib disposed in close to but spaced relation to said inner wall, said annular rib being concentric with said inner wall and being of a radially elongated width in cross section as compared to its axial depth, the width of said annular rib being on the general order of the spacing of said annular rib from said inner wall.

4,560,081

EASILY RELEASABLE AND SEALABLE SANITARY LID-SPOUT

Jay J. Adams, 133 Scott Rd., Pittsburgh, Pa. 15239

Filed Feb. 6, 1985, Ser. No. 698,896
Int. Cl.⁴ B65D *51/20*
U.S. Cl. 220—257 **17 Claims**



1. A lip spout unit for sanitary mounting in a sealing-off relation about edges of and within a pour opening in a top end wall of a container, such as a beverage can which comprises, a unitary body mounted in a sealed-off relation within the pour opening; said body having an outer peripheral mounting part, a centrally disposed open-end spout, an intermediate connecting portion between said mounting part and said spout, and a spout closing-off lid; said lid being hingedly mounted on said body to open and close off said open-end spout, said spout being of bellows-like construction biased to move outwardly with respect to the top end wall of the container when said lid is in an outwardly open position, said lid being adapted to swing between open and closed positions with respect to said mounting part, said lid when closed with respect to said mounting part being adapted to abut against outer edges of said

spout part and compress it within confines of said outer peripheral part and thereby close-off said spout part, and cooperating means carried by said lid and said outer peripheral part for retaining said lid in its closed position.

4,560,082

LID AND CONTAINER HAVING TAMPERPROOF MEANS

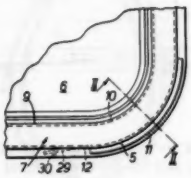
Brian L. C. Sutch, Chudleigh House, The Island, Thames Ditton, Surrey, England

Filed Jul. 17, 1984, Ser. No. 631,794

Claims priority, application United Kingdom, Jul. 22, 1983, 8319856; Nov. 28, 1983, 8331725

Int. Cl.⁴ B65D *41/32*

U.S. Cl. 220—270 **4 Claims**



1. A lid having an inverted U-section rim in which nests an inverted U-section lip of a container, the lid rim having at least one opening in the outer limb, characterised in that the outer limb of the container lip and lid rim are continuous around the lid, the outer limb of the container lip has an outwardly projecting portion which is received by the lid opening to prevent removal of the lid after application to the container and includes means to rupture the connection between the part of the lid outer limb in the path of which, in the direction of lid removal, lies the outwardly projecting portion of the container rim to thereby permit removal of the lid from the container.

4,560,083

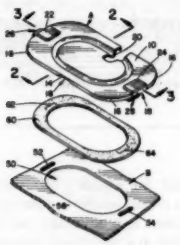
CLOSURE AND METHOD FOR AN APERTURE

Henry F. Danico, Stoneham, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 16, 1984, Ser. No. 571,316

Int. Cl.⁴ B65D *39/00*

U.S. Cl. 220—307 **19 Claims**



1. A closure assembly for closing an aperture in a panel comprising:

a thin plate member having an inner face portion, a peripheral edge and a plurality of tabs which depend from said inner face, said plate member inner face having tab receiving recesses at said peripheral edge receiving a first portion of each tab, said tabs having locking portions adapted to retain said plate member positioned on one side of a panel in a closing relationship with a predetermined aperture having an area which is smaller than the area of said plate member, means for constraining seal means in at least one of a radially inward and a radially outward direction relative to said plate member; and, seal means associated with said plate member adapted to be interposed between said plate member inner face and a portion of the panel one side which surrounds an aperture to be closed, said seal means being selectively expansible for enhancing sealing between said plate member and the associated panel.

4,560,084

HEATER PREFORM FOR SEALING A CLOSURE

Sumner H. Wolfson, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Division of Ser. No. 298,786, Sep. 2, 1981, Pat. No. 4,507,907.

This application Jan. 9, 1985, Ser. No. 689,877

Int. Cl.⁴ B65D *41/00*

U.S. Cl. 220—359 **11 Claims**

1. A heater preform for sealing a package containing electronic components to a lid when the preform is positioned between sealing surfaces of the package and lid and is heated to a predetermined temperature, comprising:

a heater portion having an area and shape corresponding substantially to said sealing surface; and

first and second contact portions coupled to said heater portion.

4,560,085

PACKAGING CONTAINER

Dieter Vom Hofe, Cologne, and Klaus Meyer, Kaarst, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

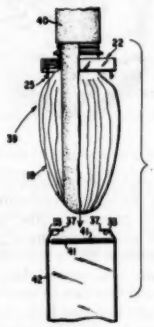
Division of Ser. No. 326,169, Nov. 30, 1981, Pat. No. 4,430,068.

This application Sep. 19, 1983, Ser. No. 533,347

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045710

Int. Cl.⁴ B31B *7/00*

U.S. Cl. 220—465 **1 Claim**



1. A mechanically stabilized case of paper, cardboard, metal, plastic or a combination thereof, said case having an opening therein containing a combination adapter cover and sealing liner comprising a hollow thin-walled plastic extension with a neck part integrally attached thereto, having fixing cams extending downwardly from said neck part and engaged with

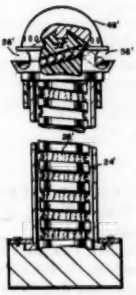
corresponding socket means of an adapter cover adapted to cover an opening, said adapter cover having first means extending downwardly to form socket means engaging said fixing cams, whereby rotation in a circumferential direction is prevented and second means adapted to automatically engage with a lip, and means comprising a lip receiving and permanently clasping said second means adapted to automatically engage with a lip.

4,560,086

HELICAL ELEVATING DISPENSER FOR ROUND OBJECTS SUCH AS CANDIES

Israel Stoi, 639 Rocksprings Rd., Pittsburgh, Pa. 15228

Filed Sep. 21, 1983, Ser. No. 534,364
Int. Cl.⁴ B65D *83/04*
U.S. Cl. 221—24 **8 Claims**



1. A dispenser for small, firm, round objects such as jaw breakers, comprising:

a body including a generally cylindrical tower having an outer peripheral sidewall with means defining a helical groove of a plurality of turns therein, said groove having an outlet located towards an end of said tower;

a sleeve including a tubular portion having said body coaxially rotationally received therein, said sleeve tubular portion having an inner peripheral sidewall which is radially gapped from said groove so as to provide a clearance for receipt of a plurality of said objects serially disposed in the groove, each in frictional contact both with the body, in said groove, and the sleeve, against the inner peripheral sidewall of said tubular portion; and

resilient means radially projecting into said groove along the length thereof for preventing roll-back of objects being dispensed, so that as the sleeve is rotated in one angular sense relative to the body, any said objects received in said clearance are advanced serially along said groove to said outlet and as the sleeve is rotated in an opposite angular sense relative to the body, any objects received in said clearance are retracted serially along said groove from said outlet;

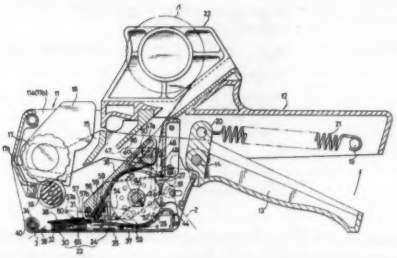
said resilient means being constituted by a series of flexible bristles mounted on at least one of the outer peripheral sidewall of said tower and said inner peripheral sidewall of said tubular portion of said sleeve.

4,560,087

LABEL PEELING DEVICE FOR LABEL ISSUING MACHINE

Yo Sato, Tokyo; Tadao Kashiwaba, Iwate; Masaru Sakurai, Saitama; Yasuhiko Matsuda, and Koichi Kondo, both of Iwate, all of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Dec. 23, 1982, Ser. No. 452,705
Claims priority, application Japan, Dec. 28, 1981, 56-210022; Feb. 3, 1982, 57-14995
Int. Cl.⁴ B65H *5/28;* **B65C** *9/42, 11/02*
U.S. Cl. 221—73 **2 Claims**



1. A label issuing machine, comprising:

a machine body; a supply unit attached to the body for supplying a label web, wherein the label web comprises a plurality of labels adhered in series to a web of backing paper;

a label peeling device for peeling each label, in turn, from the web of backing paper; the label peeling device comprising:

a peeling unit past which the label web is advanced, and the peeling unit including deflecting means for deflecting the backing paper web sharpiy in a direction that labels will normally separate from the backing paper web as the backing paper web advances past the deflecting means;

a feed unit for feeding the label web from the supply unit, for advancing the label web past the deflecting means, and for advancing the backing paper web beyond the deflecting means;

an auxiliary peeling member in the vicinity of the deflecting means for completing the peeling of labels which have begun to peel from the backing paper web at the lead edge of the label; the auxiliary peeling member being reciprocated from a position along the backing paper web which is spaced from the deflecting means along the part of the backing paper web after the labels have been peeled and being reciprocable toward the deflecting means and over the surface of the backing paper web from which the labels are being peeled, the peeling element being movable for engaging the leading end of any label part of which has remained adhered to the backing paper web past the deflecting means and for peeling that leading end and the label from the web of backing paper.

4,560,088

VENDING MACHINE WITH DISPENSING OPERATING SYSTEM MOVABLE IN X-Y COORDINATE AXES

Larry K. Tan, 1347 Castlemont Avenue, Apt. 1, San Jose, Calif. 95128

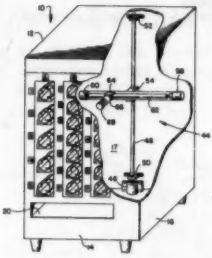
Filed May 11, 1984, Ser. No. 609,324
Int. Cl.⁴ G07F *11/36*
U.S. Cl. 221—75 **27 Claims**

1. In combination with a vending machine having a plurality of article dispensing devices arranged in an array, an operating system movable along X-Y axes to operate a selected dispensing device comprising:

an actuator positionable relative to and adapted to operate a selected one of said dispensing devices in the array;

a carriage supporting the actuator for movement along substantially X-Y axes to position said actuator in operative relation to the dispensing device;

first motive means for moving said carriage in a first, Y direction, including first drive means, a first member operatively coupled to said first drive means and a first element reciprocally movable along said first member;



second motive means for moving said carriage in a second, X direction, including second drive means, a second member operatively coupled to said second drive means, and a second element reciprocally movable along said second member; and

control means for controlling the operation of the first and second motive means and the actuator.

4,560,089

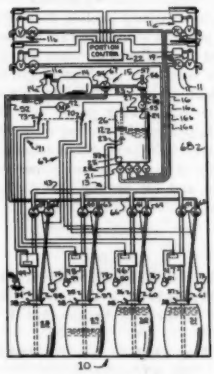
APPARATUS FOR DISPENSING A CARBONATED BEVERAGE

John R. McMillin, Maplewood, Minn., and Peter Strandwitz, Neenah, Wis., assignors to The Cornelius Company, Anoka, Minn.

Division of Ser. No. 262,151, May 11, 1981, Pat. No. 4,377,246, which is a division of Ser. No. 001,027, Jan. 4, 1979, Pat. No. 4,305,527, which is a division of Ser. No. 806,136, Jun. 13, 1977, Pat. No. 4,143,793. This application Sep. 7, 1982, Ser. No. 415,058

Int. Cl.⁴ B67D *5/54*

U.S. Cl. 222—14 **1 Claim**



1. Apparatus for dispensing a carbonated beverage, comprising:

(a) a plurality of beverage dispensing valves;

(b) a beverage reservoir, said reservoir being fluidly connected to each of said beverage valves;

(c) a beverage supply conduit having a downstream end fluidly connected to said reservoir and an upstream end adapted to be fluidly connected to a supply vessel having carbonated beverage therein;

(d) means for pressurizing such a supply vessel with propellant gas;

(e) portion control means operatively connected to said plurality of said dispensing valves for controlling activation of said dispensing valves for dispensing a predetermined volume of carbonated beverage from each respective valve, said portion control means being operable for simultaneously activating each of said plurality of dispensing valves for the simultaneous dispensing of a plurality of discrete predetermined portions of beverage;

(f) means for maintaining a predetermined quantity of carbonated beverage within said reservoir, said quantity having a volume which is less than the total volume of the reservoir;

(g) means fluidly connected to the reservoir for regulating the pressure of gas within the reservoir at a pressure less than the pressure from said supply vessel pressurizing means; and at a pressure at least equal to the carbonation saturation pressure of the beverage in the reservoir for maintaining the beverage carbonation;

(h) means for maintaining a predetermined quantity of gas in said reservoir and atop of said quantity of carbonated beverage, said gas quantity maintaining means including an automatic vent for releasing gas originating with said carbonated beverage; and

(i) a normally closed solenoid valve in said beverage supply conduit for normally precluding flow of beverage through the supply conduit in a direction from the supply to the reservoir, said normally closed valve being connected to and being openable by said beverage quantity maintaining means.

4,560,090

BAG-IN-BOX PACKAGE

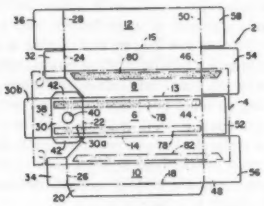
Masataka Okushita, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 236,547, Feb. 20, 1981, Pat. No. 4,386,923. This application Sep. 24, 1982, Ser. No. 423,438

Claims priority, application Japan, Feb. 22, 1980, 55-21176; Feb. 22, 1980, 55-22041[U]; Apr. 24, 1980, 55-56090[U]; May 22, 1980, 55-68186; Jul. 22, 1980, 55-104127[U]

Int. Cl.⁴ B67B *7/24;* **B65D** *35/56*

U.S. Cl. 222—81 **4 Claims**



1. A bag-in-box package comprising:

(a) a box including:

(1) a set of four panels connected together and forming a rectangular tube,

(2) a set of four top flaps hingedly connected to the respective panels and conjointly closing one end of the rectangular tube,

(3) a set of four bottom flaps also hingedly connected to the respective panels and conjointly closing the other end of the rectangular tube, and

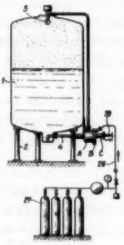
(4) adhesive means retaining the panels, the top flaps, and the bottom flaps in the noted positions;

(b) a bag disposed within the box and formed by two substantially rectangular, superposed layers of flexible material hermetically sealed together, the bag being inflated into close internal contact with the box;
(c) a fitment attached to one of the layers of the bag and projecting outwardly of the box;
(d) additional adhesive means securing one of the layers of the bag at least to one of the inside surfaces of the box in the vicinity of said fitment; and
(e) a dispenser mechanism including:
(1) a spout firmly engaged with the fitment,
(2) a cap removably engaged with the spout,
(3) a seal interposed between the fitment and the spout for sealingly closing the fitment, and
(4) an opener member removably placed in the space formed by the spout and the cap.

4,560,091
STATIONARY BEER CONTAINER

Hubertus J. Souren, Enschede, Netherlands, assignor to Grolsche Bierbrouwerij B.V., AB Enschede, Netherlands

Filed Mar. 15, 1983, Ser. No. 475,551
Claims priority, application Netherlands, Mar. 16, 1982, 8201086
Int. Cl.⁴ B65D *83/14*
U.S. Cl. 222—155 **10 Claims**

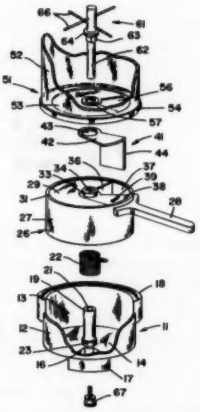


1. Apparatus for storing and dispensing beer comprising:
a stationary beer container;
a lower flow connection into said container;
an upper flow connection into said container;
a substantially vertical flow line connected at a first upper end into said upper flow connection for separate pump functions of gas flow during beer dispensing, cleaning fluid flow, and measurement of beer level in said container;
a flow line coupling and valve assembly connected between said lower connection and a second lower end of said vertical flow line including means comprising an annular coupling flange for connecting a tap head to said flow line coupling for flow communication with said flow line coupling and operation of said valve assembly for controlling flow between said tap head and said flow line coupling;
said flow line coupling having a central tube closed at an outer end and having port means inward from said outer end and defining flow passage means into said lower flow connection and a housing around and spaced from said central tube defining second annular flow passage means around said first central tube and opening into said lower end of said vertical flow line;
said valve assembly including an annular valve member movable along said tube between first and second operating positions on opposite sides of said port means;
said valve member shutting off flow through said tap head connection means while permitting flow through said port means between said first and said second flow passages at said first operating position; and
said valve member at said second operating position isolating said first flow passage means from said second flow passage means inward from said valve member while directing flow between said first and said second flow passage means outward of said valve member and separate flow channels in a tap head when said tap head is connected with said tap head connecting means.

4,560,092
VARIABLE QUANTITY DISPENSING DEVICE FOR GRANULAR MATERIAL

David W. Souza, 41903 Corte Santa Barbara, Fremont, Calif. 94538

Filed May 7, 1984, Ser. No. 607,735
Int. Cl.⁴ G01F *11/10*
U.S. Cl. 222—168 **12 Claims**



1. A device for dispensing a selectively variable measured quantity of granular material from a container, including;
an upwardly opening cup-shaped first member having a generally cylindrical first sidewall, a bottom panel closing the lower end of the sidewall, a discharge port in the said bottom panel, a flange extending radially outwardly from the upper end of said sidewall and circumscribing a portion of the periphery thereof, the remainder of the periphery of said sidewall having a reduced height, a first hollow tubular projection extending upwardly and coaxially from said bottom panel and including a first bore extending therethrough, a helical spring secured about said first tubular projection;
a hollow cylindrical dispensing member, including a second sidewall disposed concentrically within said cup-shaped member in rotatable fashion, a handle extending outwardly from said second sidewall and through said reduced height portion of said first sidewall to facilitate rotation of said dispensing member through a limited angular excursion, a top panel extending across the upper end of said second sidewall, a measuring chamber extending through said top panel and adapted to be rotated into registration with said discharge port, a second tubular projection extending upwardly and axially from said top panel, a second bore extending through said tubular projection;
an adjustment member, including a collar portion rotatably received about said tubular projection, a lateral portion parallel to and impinging on said top panel, and a depending panel portion extending into said measuring chamber and forming one movable sidewall thereof,
means for fixing said adjustment member in a desired position,
a reservoir container secured superjacently to said dispens-

ing member for storing said granular material to be dispensed, and an intake port formed in the bottom of said reservoir and angularly alignable with said measuring chamber to fill said measuring chamber.

4,560,093

TYPE OF DISPENSER IN PARTICULAR FOR LIQUID SOAP

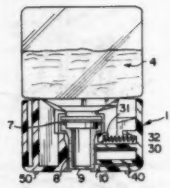
Antonio M. Cassia, Milan, Italy, assignor to Steiner Company, Inc., Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,349

Claims priority, application Italy, Sep. 2, 1982, 22769/82[U]

Int. Cl.⁴ B67D *5/06*

U.S. Cl. 222—181 **7 Claims**



1. A dispenser for liquid soap disposed in a container equipped with a dispensing nozzle, said dispenser comprising: first and second bodies each in the form of a generally rectangular box-like structure with an open top and one open side, said bodies being cooperable with their open sides facing each other to form a substantially box-like open-top external envelope, said first body having lateral surfaces with set-back areas to engage said second body, and internal plates that cooperate with said lateral surfaces to engage guide elements protruding from said second body, run-stopping means to prevent slipping between said second and said first bodies consisting of juts protruding from said second body parallel to said guide elements and terminating with pawl-engaging ledges formed between said set-back areas and the lateral surfaces of said first body, and means on said envelope forming a seat for removably supporting the associated soap container, said envelope having an opening therein for receiving the dispensing nozzle when the container is supported thereon, said second body being slidably movable with respect to said first body for engagement with the dispensing nozzle to dispense a measured amount of liquid soap.

4,560,094

PARTICULATE SOLID STORAGE CONTAINER AND TRANSPORT METHOD

David F. Eales, Kinnesswood, Scotland, assignor to British Gas Corp., London, England

Continuation of Ser. No. 231,301, Feb. 3, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,407

Claims priority, application United Kingdom, Dec. 3, 1980, 8039716

Int. Cl.⁴ B65G *53/50*

U.S. Cl. 222—195 **7 Claims**

1. A storage container for particulate solids comprising:

an outer wall defining an enclosed chamber for the solids;

a plurality of vertical outlet openings at or adjacent the base of the chamber permitting the particulate solids to exit downwardly from the chamber,

an outlet pipe for each outlet opening, said outlet pipe extending downwardly from said outlet opening;

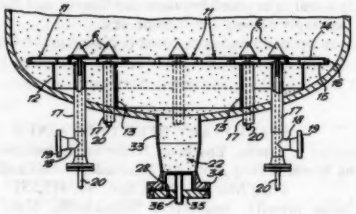
a fluidizing means including a porous surface surrounding each outlet opening and extending horizontally therefrom;

a gas inlet pipe means for delivering a pressurized gas to a location below said porous surface to pass therethrough to fluidize the particulate solids thereabove;

means individual to each said outlet opening for constraining the solids to flow only in a substantially horizontal manner from a concentric, annular area located beyond each outlet opening to said outlet opening, said constraining means comprising

a deflector having a flat base that is larger than said outlet opening; and

means for horizontally mounting said deflector base spaced immediately above said outlet opening and at least an annular portion of said surrounding porous surface such that a generally annular horizontally extending passageway extends horizontally, laterally from said outlet opening between said deflector base and said porous surface, said spacing and hence said passageway having a vertical height such that the particulate solids remain fluidized from a delivered pressurized gas and flow only in a generally horizontal direction, and including a plurality of concentric rings of constrictions in said passageway, extending from said deflector base to said porous surface, each said ring comprising spaced apart segments such that a plurality of openings extend through said ring.



4,560,095

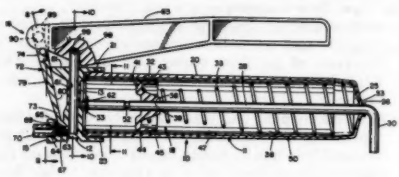
LEVER OPERATED LUBRICATOR

Jerry D. Shew, Niles, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 7, 1983, Ser. No. 472,590

Int. Cl.⁴ G01F *11/04*

U.S. Cl. 222—256 **14 Claims**



1. A hand operated lubricant dispenser, comprising; a cylinder adapted to receive lubricant in either bulk form or in a cartridge, a one-piece plastic head member enclosing one end of the cylinder having a bore therein communicating with the interior of the cylinder, said head member having an outlet fitting communicating with the bore, a piston slidable in and projecting from the bore, adapted to dispense lubricant in the bore through the outlet fitting under high pressure, a spring biased follower assembly in the cylinder adapted to force lubricant in the cylinder forwardly toward the head member and into the head bore, a lever assembly for reciprocating the piston in the head bore including a flexible plastic link integrally molded with and rigidly connected to the head member at one end and having a pivotal connector at its other end proximal to the piston, and a lever pivotally connected to the link connector at one end thereof and also pivotally connected to the projecting end of the piston, whereby as the lever is manually pivoted about the link connector the piston will be

driven linearly as the link flexes to accommodate the geometry of the lever and piston.

4,560,096

DETACHABLE BAG INTENDED PARTICULARLY FOR USE WITH A MOBILE CONTAINER

Peter Lucas, and John Staveley, both of 42-46 Broad St., Portsmouth, Hampshire, P01 2JF, England

Filed Apr. 11, 1984, Ser. No. 599,156
Int. Cl.⁴ B62B *5/00*
U.S. Cl. 224—42.42 **3 Claims**

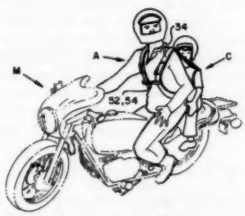
1. A detachable bag for use in a conventional open topped supermarket trolley container, the bag being formed from flexible sheet material and having a flat base part to rest in the bottom of the trolley container and upstanding walls to receive within them a supply of goods, the upper peripheral area of the bag having, on opposite sides thereof, similar downwardly facing hook means permanently secured to said upper peripheral area for engaging over the upper periphery of a supermarket trolley container to suspend said opposite sides of the bag from the upper end thereof, said hook means being engageable one with the other to close the bag, strap form handle means attached to the bag on opposite sides thereof, and each strap form handle being attached to the upper portion of the bag to either side of a respective hook means.

4,560,097

SAFETY HARNESS FOR MOTORCYCLE PASSENGER

John F. Reynolds, and Janie B. Reynolds, both of 220 Allouette #3, Carson City, Nev. 89701

Filed May 9, 1984, Ser. No. 608,542
Int. Cl.⁴ B62J *23/00*
U.S. Cl. 224—160 **15 Claims**



1. A safety harness for attaching two persons together, one behind the other, comprising:

a vest to be worn by the one person, and having a neck opening with shoulder portions on each side thereof, a front and a back;

two straps extending freely forwardly from the shoulder portions, downwards past the front of the vest and returning under the vest to the back of the vest;

said straps crossing over below said vest to form leg loops for said one person; and

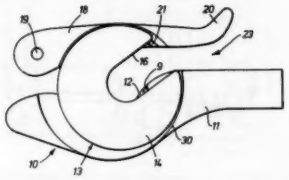
said straps being extendable forwardly of the vest to form shoulder loops which can be located over the shoulders of the other person located in front of said one person and to whom said one person is thereby attached.

4,560,098

THREADING DEVICE

Alan W. Tupper, Castle Combe, England, assignor to Latchways Limited, London, England

Filed Oct. 17, 1983, Ser. No. 542,357
Claims priority, application United Kingdom, Nov. 9, 1982, 8231930; Feb. 3, 1983, 8303016
Int. Cl.⁴ B63B *21/04, 21/54*
U.S. Cl. 226—92 **15 Claims**



1. A threading device comprising

a body part;

a rotor part comprising a hub and at least one wheel having a recess in its periphery, the wheel being rotatably mounted on the body part with a portion of the wheel protruding from the body part;

a threading member cooperating with said protruding portion of the wheel and having an elongate threading portion extending in the general plane of the wheel to one side of the wheel for engagement with an annular, endless or apertured element to be threaded,

the threading member and the wheel having arcuate interengaging means to permit rotation of the wheel relative to the threading member and to allow said threading member to pass through said element to be threaded,

said wheel having an initial position, in which said recess is in general alignment with a space which is defined, during use of the device, between said threading portion of the threading member and an opposing portion of said body part; and

further comprising means automatically returning the wheel to the initial position after a displacement therefrom in which said element to be threaded passes through the wheel; said returning means comprising

(i) an elongate elastic member having a first end secured to the body, extending around the hub of the rotor, and having a second end engaging the rotor and urging the rotor to said initial position, and

(ii) means to hold the rotor in said initial position.

4,560,099

FOLDING DEVICE FOR MACHINES FOR TREATING FOLDED FABRICS, PARTICULARLY PRINTED FABRICS

Amedea Arioli, and Lorenza Arioli, both of Como, Italy, assignors to Arioli & C. S.r.l., Varese, Italy

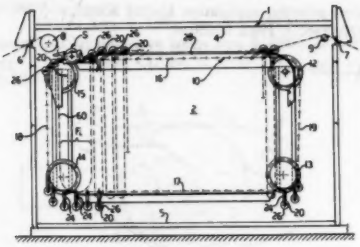
Filed Sep. 20, 1984, Ser. No. 652,828
Claims priority, application Italy, Oct. 7, 1983, 23203 A/83
Int. Cl.⁴ B65H *17/42*
U.S. Cl. 226—105 **6 Claims**

1. A device for folding fabrics adaptable to a machine for treating printed fabrics, said device being housed in a chamber having an inlet and outlet for the fabric, comprising:

an endless conveyor within said chamber including two chains and spaced wheels for supporting said chains so as to define an active pass, a return pass and two vertical

passes of said conveyor extending between said inlet and said outlet;

a plurality of rods for supporting the folded fabric and spaced from each other, each of said rods connected to said chains by means of a first pair of arms wherein said arms are hinged at one end to each of said chains and rotatably connected at the other end thereof to the end of said rod;



a pair of rails for supporting said rods, extending above and parallel to said active pass of said chains; and

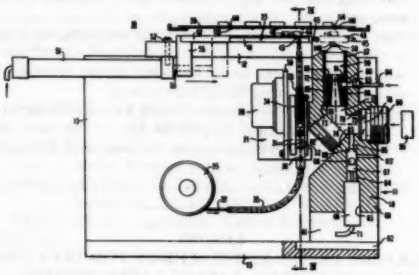
at least one rotary arm lift means supported upstream of said rails including means to intercept said rods hinged to said chains so as to lift successive rods with the fabric folded thereon to a position on said rails.

4,560,100

AUTOMATED SOLDERING PROCESS AND APPARATUS

Richard L. Hall, West Friendship, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1984, Ser. No. 662,648
Int. Cl.[4] B23K *1/08*
U.S. Cl. 228—40 **14 Claims**



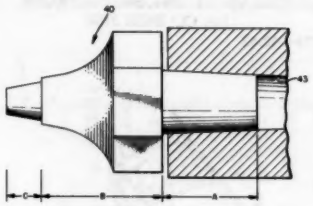
12. In a system for applying molten solder to a plated hole from the underside of a printed wiring board, the improvement of a solder applying assembly, comprising a vertically oriented cylinder, a cylindrical crucible assembly having a solder carrying chamber and a susceptor surface, said crucible assembly being mounted slidably in the cylinder, means to apply fluid under pressure to prepare the crucible assembly upwardly in the vertical cylinder, means to melt solder in the crucible chamber, and means to hold a printed wiring board in horizontal position above the crucible assembly such that the crucible chamber registers with a plated hole for applying the solder.

4,560,101

SELF-LOCKING, REMOVEABLE TAPERED TIPS FOR SOLDERING AND DE-SOLDERING TOOLS

Jack L. Wilhelmson, and Paul L. Urban, both of Cheraw, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 16, 1983, Ser. No. 504,970
Int. Cl.[4] B23K *3/02*
U.S. Cl. 228—54 **19 Claims**



1. A soldering or de-soldering tool having a handle, a heating element, an operating end, and a replaceable soldering or de-soldering tip which has an attachment portion for attachment to the operating end of the tool and a soldering or de-soldering portion, the improvement comprising:

a tapered tip-receiving bore formed in the operating end of the tool for accepting the replaceable tip, and

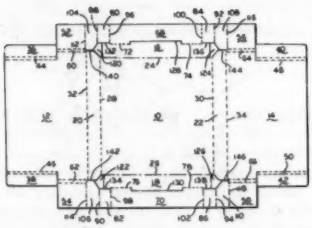
a tapered attachment portion of the tip sized to fit within the tapered tip-receiving bore and securedly fix the tip to the tool by only the manual pressing of the tip into the tip-receiving bore, the attachment portion of the tip (i) having a higher coefficient of heat expansion than that of the material of the tool at the tip-receiving bore and (ii) being rotationally symmetrical so as to allow loosening by rotation of the tip with respect to the tip-receiving bore.

4,560,102

REVERSIBLE FOLDER AND ROUND TRIP MAILER BOX

Joseph Dlugopolski, Lombard, Ill., assignor to Fidelity Container Corporation, Elk Grove Village, Ill.

Continuation of Ser. No. 423,610, Sep. 27, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 645,539
Int. Cl.[4] B65D *85/00*
U.S. Cl. 229—40 **11 Claims**



1. A round trip box made from a unitary blank having at least a bottom panel with four edges, four side panels positioned adjacent to and individually associated with said four edges, each of said edges and its individually associated side panel having the same length, a pair of top panels coupled to opposite ones of said side panels, a pair of end panels coupled to the other ones of said side panels, said unitary blank further having first, second and third side-by-side corner panels in each of the corners adjacent each adjoining pair of side panels, said first panel in each of said corners being attached to one of said top panels, said third of said panels being attached to one of said

end panels, said third of said corner panels automatically forming a bracing panel responsive to a folding of said blank, said bracing panel being set at an angle by said folding in order to strengthen the corner when said blank is in a box configuration, each of said top panels having a width which is substantially greater than one-half of the width of the bottom, whereby said top panels overlap each other near the center of the box, and means for displaying an address on each of said top panels in the area of said overlap, whereby the addresses may be changed by reversing the overlapped positions of said two panels.

4,560,103

APPARATUS FOR HEATING AND VENTILATING

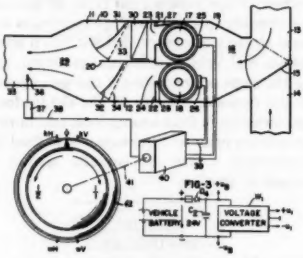
Joachim Schulz, Mudau, and Werner Thelen, Buchen, both of Fed. Rep. of Germany, assignors to AURORA Konrad G. Schulz GmbH & Co., Mudau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 415,597, Sep. 7, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,433

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135909

Int. Cl.⁴ G05D *23/00*

U.S. Cl. 236—13 **9 Claims**



1. An apparatus for heating and ventilating, said apparatus comprising:

a housing having an air inlet region for recirculated air and for fresh air; an air outlet region; a mixing chamber located upstream of, and in communication with, said outlet region; and a first and second duct arranged parallel to one another and in communication with said inlet region and said mixing chamber;

a separate blower respectively arranged in each of said first and second ducts;

a heat exchanger arranged in said first duct between said blower thereof and said mixing chamber;

means for adjustably controlling the speed of both of said blowers, and hence the flow in said first and second ducts, in a simultaneous and inversely proportional manner; and

said blowers are radial-flow blowers, including in each of said first and second ducts, downstream from the associated blower, a free-swinging check valve flap.

4,560,104

COOLANT TEMPERATURE CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Shinichi Nagumo; Yoshifumi Hase, both of Yokohama, and Fumio Sanezawa, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 5, 1983, Ser. No. 557,884

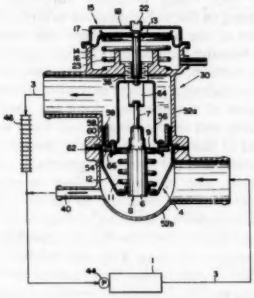
Claims priority, application Japan, Dec. 6, 1982, 57-213599; Mar. 3, 1983, 58-30794[U]

Int. Cl.⁴ F01P *7/02*

U.S. Cl. 236—34.5 **20 Claims**

1. A coolant temperature control system of an internal combustion engine, comprising:

a thermostat valve means disposed in a coolant passageway leading to a radiator and including a thermally responsive member which is movable in response to the temperature of a engine coolant flowing through the coolant passageway, a valve seat, and a movable valve member associated with said thermally responsive member and capable of operating in accordance with the movement of said thermally responsive member, said thermostat valve means being closable to block the coolant passageway so as to prevent the flow of said coolant to the radiator when said temperature of said engine coolant is below a thermostat valve opening temperature;



means for increasing the value of said thermostat valve opening temperature when said engine operates in a low load engine operating range over the value of said thermostat valve opening temperature when said engine operates in a high load engine operating range; and

pressure-responsive means connected to said valve seat or said valve member for driving said thermostat valve means in a direction to open in response to the discharge pressure of a coolant pump disposed in the coolant passageway.

4,560,105

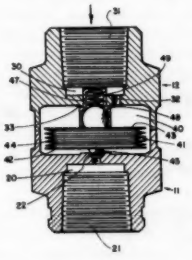
BELLOWS-ACTUATED THERMOSTATIC STEAM TRAPS

Niranjan T. Jiandani, Emmaus, Pa., assignor to Spirax Sarco, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 569,977, Jan. 11, 1984. This application Jan. 3, 1985, Ser. No. 688,330

Int. Cl.⁴ F16T *1/02*

U.S. Cl. 236—58 **6 Claims**



1. A bellows-actuated thermostatic steam trap comprising a metal housing, which constitutes at least 70% of the mass of the trap, within which there is a bellows containing a volatile liquid whose saturation curve closely parallels but is a few degrees below that for saturated steam, and carrying a part of a valve for opening and closing the trap, the bellows being disposed between connections in the housing which are identical to one another, so as to be selectively connectable in a

steam flow line with the valve disposed either downstream of, or upstream of, the bellows;

said connections being opposed and adapted for connection in a steam flow line such that when the valve is disposed downstream of the bellows, the valve is below the bellows, whereas when the valve is disposed upstream of the bellows, the valve is above the bellows; and

the part of the valve carried by said bellows is a valve member that cooperates with a fixed valve seat; said bellows being elongated and having opposed ends that are interconnected by an accordion side wall; one of the bellows ends carrying the valve member and the other of the bellows ends being pivotally supported for obtaining self-aligning of the valve member with the valve seat upon expansion of the bellows to close the valve;

said metal housing including: (a) a first, generally cylindrical housing portion, having a hollow interior, this housing portion including a passage extending from the exterior to the interior of the housing along the longitudinal axis of the housing and terminating in said fixed valve seat which is located at the point where this passage enters said hollow interior; and (b) a second, generally cylindrical housing portion, also having a hollow interior, mounted in mating co-axial juxtaposition to the first housing portion to define therewith a housing having an internal chamber, the second housing portion being provided with a longitudinal passage extending from the exterior to the interior, and a bellows attachment face located on the longitudinal axis of this second housing portion proximate the terminus of this passage, which passage begins as a single bore and divides into a plurality of smaller offset bores radially distributed about the bellows attachment face;

the trap operating, when connected with the valve disposed downstream of the bellows, in a first mode in which, in normal operation, the trap discharges condensate at a temperature close to saturated steam temperature, whereas when connected with the valve disposed upstream of the bellows, the valve operates in a second mode in which, in normal operation, condensate is discharged at a temperature significantly below steam temperature.

4,560,106

HEATING AND/OR AIR-CONDITIONING INSTALLATION FOR MOTOR VEHICLES

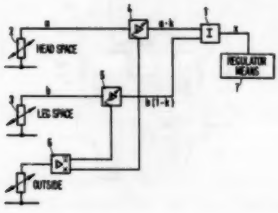
Werner Dorsch, Gerlinden, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 625,978

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323568

Int. Cl.⁴ G05D *23/00*

U.S. Cl. 236—91 E **10 Claims**



1. A heating and/or air-conditioning installation for motor vehicles, comprising an interior space-temperature-regulating system including interior space-temperature regulating means, temperature sensor means in the hand space and temperature sensor means in the leg space, and means operatively connecting the temperature sensor means with the regulating means as a function of the outside temperature in such a manner that at lower outside temperatures the influence of the leg space temperature sensor means dominates the influence of the head space temperature sensor means on the regulating means.

4,560,107

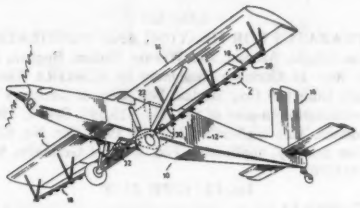
AERIAL SPRAYING APPARATUS

Ion Inculet, London, Canada, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 398,004, Jul. 14, 1982, abandoned. This application Jun. 13, 1983, Ser. No. 503,557

Int. Cl.⁴ B05B *5/02*; B64D *1/18*

U.S. Cl. 239—3 **22 Claims**



4. A method of spraying a fluid from an airborne vehicle having two laterally spaced sets of spray nozzles to discharge said fluid and an electrode associated with each nozzle of each set to maintain said vehicle at neutral potential, said method comprising the steps of generating a charge of predetermined magnitude and opposite polarity on the electrodes of respective sets and inducing in fluid issuing from said nozzle a charge of opposite polarity prior to dispersion of said fluid into a cloud thereby generating a pair of laterally spaced oppositely charged clouds of droplets.

4,560,108

SPRINKLER

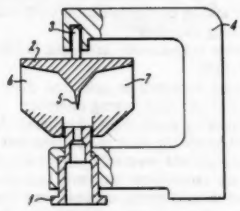
Zvi Rubinstein, 14, Ilan St., Giv'at Shmuel, Israel

Filed Apr. 20, 1984, Ser. No. 602,390

Claims priority, application Israel, Apr. 20, 1983, 68440

Int. Cl.⁴ B05B *3/04*

U.S. Cl. 239—222.17 **3 Claims**



1. In a sprinkler of the kind comprising a spray nozzle adapted to be connected to a water supply pipe and having an axially extending jet outlet opposite which a flow distributor head, i.e., a deflector head, is mounted on an axial shaft of the distributor head and is coaxial with and rotatable relative to said nozzle, said distributor head having limited vertical movement and being provided with flow passage means thereacross, a flow divider in the central region of the flow passage means facing the spray nozzle from which flow divider at least two outflow passages extend, each outwardly to an exit, said divider having opposed flow directing sides faced by the outflow passages, a deflector wall at an angle to each said outflow passage being provided at the exit of each of said outflow passages, each said wall, when the flow impinges thereon, causing the rotation of the head; the improvement comprising the flow divider extending on both sides of an imaginary plane

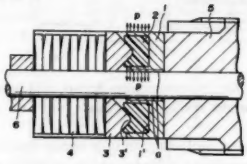
which divides and is parallel to that part of the flow passage means which lies in the region of the axis of the distributor head, said divider including a part thereof to each side of said plane with the part of the divider on each side of said plane being more remote from the deflector wall at the exit of a facing outflow passage than the axis of the head and being oriented so that it forces the flow toward said remote deflector wall.

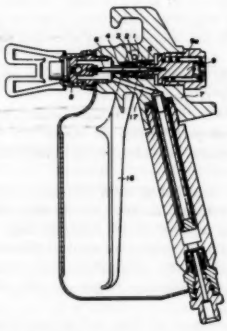
4,560,109

SHAFT SEALING DEVICE FOR SLIDING PORTION OF NEEDLE VALVE IN PAINT SPRAY GUN

Ohba Teruyuki, Yokohama; Arai Kazuo; Yahagi Atushi, both of Tokyo, and Iwakoshi Shigeru, Yokohama, all of Japan, assignors to Iwata Air Compressor Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 506,193
Claims priority, application Japan, Jun. 29, 1982, 57-112419
Int. Cl.⁴ B05B *1/30*
U.S. Cl. 239—583 **1 Claim**





1. In a shaft sealing device for preventing paints from leaking out, said shaft sealing device being interposed between a needle valve stem of a spray gun for spraying paints and a body of the spray gun, said shaft sealing device being provided on an outer diameter portion of the needle valve stem, said shaft sealing device further being provided on a sliding portion of the needle valve stem, wherein the improvement of the shaft sealing device comprises:

an annular main packing surrounding the needle valve stem, being in contact with the needle valve stem, and having a concave groove formed on one side, said concave groove being spaced from the needle valve stem;

an annular auxiliary packing having an elastic body, being spaced from the needle valve stem, having one side fitted in the concave groove formed on the one side of the annular main packing;

an annular convex-shaped packing rest being in contact with the needle valve stem and holding said annular auxiliary packing into the concave groove formed in the annular main packing; and

belleville spring means, surrounding the needle valve stem, for pressing the annular convex-shaped packing rest into the conical groove formed in the annular auxiliary packing;

wherein said concave groove formed on one side of the annular main packing faces the high pressure side of the shaft sealing device;

wherein said elastic body of the annular auxiliary packing is made of a rubber selected from the group consisting of natural rubber, nitrile rubber, fluorine rubber, silicone rubber, Thiokol ® brand rubber, chloroprene rubber, and urethane rubber; and

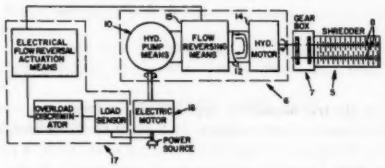
wherein said annular main packing is made of a resin selected from the group consisting of tetrafluorinated resin and a resin having solvent resistance and exhibiting a low coefficient of frictional resistance.

4,560,110

CURRENT DRAW-ACTUATED HYDRAULIC DRIVE ARRANGEMENT FOR ROTARY SHREDDER

Dan S. Burda, Carrollton, Tex., assignor to MAC Corporation of America, Grand Prairie, Tex.

Filed Jun. 17, 1982, Ser. No. 378,616
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—36 **8 Claims**



1. A drive arrangement for a shear-type shredder, comprising:

a hydraulic fluid-pumping means;

driving means for unidirectionally driving the hydraulic fluid-pumping means;

a reversible hydraulic motor means for bidirectionally driving a rotary cutter shaft in a shredder, rotation of the shaft being subject to changes in load due to variations in shredding conditions in the shredder;

a hydraulic fluid circuit means including the hydraulic fluid-pumping means and the reversible hydraulic motor means for transmitting power in a downstream direction from the driving means to the motor means and transmitting said changes in load upstream via the motor means to the driving means, the driving means being responsive to an increase in load to increase the power supplied to the pumping means;

a flow-reversing means to reverse a fluid flow in the hydraulic circuit from the pumping means to the hydraulic motor means;

electrically operable reversing control means for actuating the flow reversing means upon detecting an increase in load due to a jamming condition in the shredder including:

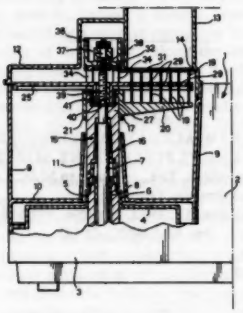
sensing means, connected to the driving means upstream of the fluid circuit means, for sensing power supplied to the pumping means and responsive to an increase in power supplied to the pumping means above a predetermined limit to produce a reversing signal; and

means responsive to said reversing signal to actuate said flow-reversing means for a period of time briefly to reverse the direction of rotation of said shaft and thereby clear the jamming condition.

4,560,111
ELECTRIC HOUSEHOLD APPLIANCE FOR CUTTING FRUIT, VEGETABLES AND SIMILAR FOOD PRODUCTS INTO SMALL STICKS OR CHUNKS OF VARIABLE THICKNESS

Alfredo Cavalli, Via Galileo Galilei, Pessano Con Bornago (Milan) 9, Italy

Filed Jan. 4, 1984, Ser. No. 567,944
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—92 5 Claims



1. An electric household appliance for cutting fruit, vegetables and similar food products into small sticks or chunks of variable thickness, of the type including a container; a motor-driven shaft extending longitudinally and axially in the container; a disc mounted on said shaft for rotation therewith; a hopper-duct extending parallel to and eccentrically of said shaft and opening into said container at one end for the introduction against said disc of food products to be cut, and an aperture defined in the disc for the passage of the cut food products into the bottom of the container, wherein the improvements consist in the appliance further including:

a cutting tool which is structurally independent of said disc and releasably fixed to said shaft, the cutting tool including an arm fixed releasably for rotation with said shaft for releasably fixing said cutting tool to said shaft and a plurality of blades fixed in a comb-like manner to the arm, said arm extending radially of the shaft at a distance from said open end of the hopper-duct substantially equal to the length of the blades;

a plurality of slots defined by the disc, through each of which passes a respective blade of the cutting tool;

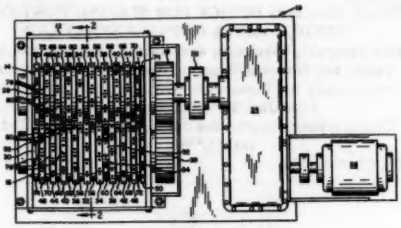
means for axially movably coupling said disc to said motor-driven shaft,

means for adjusting the axial position of said disc along said shaft, a hub fixed coaxially for rotation with said motor-driven shaft, and a slicing blade which projects laterally and radially from said hub, the slicing blade being substantially coplanar with said open end of the hopper-duct and rotating edgewise thereto and being structurally independent of said disc and said cutting tool, said appliance being capable of cutting food into small sticks when both said cutting tool and said blades are present on said shaft and slicing food when said cutting tool is removed; whereby the interaction of said cutting tool, said disc and said slicing blade can accomplish both slicing and cutting of food into small sticks of variable thicknesses.

4,560,112
SCRAP SHREDDING APPARATUS HAVING CUTTER DISCS OF DIFFERENT THICKNESS

Michael W. Rouse, West Linn, and Robert L. Thelen, Woodburn, both of Oreg., assignors to Waste Recovery, Inc., Dallas, Tex.

Division of Ser. No. 318,041, Nov. 5, 1981, abandoned. This application May 4, 1984, Ser. No. 607,225
Int. Cl.[4] B02C *7/04*
U.S. Cl. 241—236 10 Claims



1. Apparatus for comminuting scrap and waste material including reinforced resilient materials such as vehicle tires, comprising:

(a) cutting means, including an intermeshed pair of rotatably mounted, generally cylindrical cutter rolls, each of said cutter rolls including a central shaft and a plurality of cutter discs fastened thereon for rotation therewith and separated axially from one another therealong, said cutter rolls being intermeshed with one another such that a plurality of said cutter discs of each of said cutter rolls extend radially between said cutter discs of the other of said cutter rolls, for cooperatively shearing said materials into pieces;

(b) drive means for counter-rotating said intermeshed cutter rolls about their respective axes;

(c) each of said cutter discs including a central wheel fixedly located on the respective central shaft;

(d) each of said central wheels having an axial thickness and a periphery;

(e) a plurality of detachable outer portions fastened to the periphery of each said central wheel, each of said outer portions having an axial width substantially equal to the axial thickness of the respective central wheel to which it is fastened, and having respective lateral surfaces and exterior surfaces defining edges at the intersections thereof; and

(f) the axial thickness of at least a first one of said central wheels being greater than the axial thickness of at least one other one of said central wheels by at least an amount sufficient to permit respective ones of said detachable outer portions to be used while fastened to said first one of said central wheels until said ones of said detachable outer portions are worn to an unsatisfactory conditions, and to permit said ones of said detachable outer portions to be sharpened to a satisfactory condition by removal of material from their respective lateral surfaces and to have an axial width substantially equal to the axial thickness of said second one of said central wheels after so being sharpened.

4,560,113
CONVERTIBLE VERTICAL SHAFT IMPACT CRUSHER

Scott E. Szalanski, Oak Creek, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Jun. 27, 1984, Ser. No. 624,892
Int. Cl.[4] B02C *23/00*
U.S. Cl. 241—275 3 Claims

1. A vertical shaft impact crusher, comprising:

a housing having an outside surface and an inside surface;

a rotor mounted within said housing for rotation about a central vertical axis, said rotor having vertically spaced top and bottom plates, and means for propelling rock outwardly from said rotor when said rotor is rotated about its axis and rock is fed axially into said rotor;

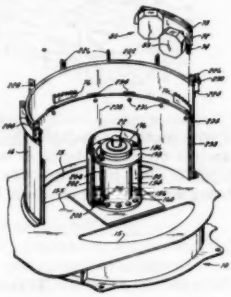
a feed tube for feeding rocks to an axial center of said rotor;

means for rotating said rotor about its axis;

an annular impact breaker ring supported for vertical adjustment in said housing coaxially with said rotor; said breaker ring holding, in an annular array horizontally aligned with said rotor, a multiplicity of impact elements against which rock thrown by said rotor impinges and breaks;

an alernate breaker ring designed for autogenous crushing;

support and vertical adjustment means within said housing



for removably supporting either of said breaker rings in said housing;

said support and vertical adjustment means including a plurality of support blocks equally spaced at specified angles around and connected to the inside surface of said housing at equal height, and each support block having a plurality of steps formed thereon at different elevations to provide a plurality of elevation settings for either breaker ring; and

said breaker rings each having a plurality of legs depending vertically therefrom, said legs being angularly spaced around each of said breaker rings at angular positions corresponding to the angular spacing of said support blocks around inside surface of said housing, each of said legs being configured to seat securely on any of said steps, slectively, so that vertical adjustment of either of said breaker rings may be accomplished.

4,560,114

REEL FOR TAPE-LIKE MATERIAL, ESPECIALLY MAGNETIC TAPE

Kurt Schmidts, Kehl; Hans-Otto Feyh, Neuried, and Max J. Mania, Willstaett, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

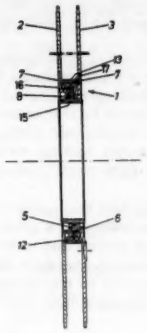
Filed Mar. 20, 1984, Ser. No. 591,595

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 8309239[U]

Int. Cl.[4] B65H *75/18*

U.S. Cl. 242—71.8 **9 Claims**

1. A reel for material of tape-like configuration, especially magnetic tape, consisting of (a) an annular hub with an opening for the admission of the drive spindle of a tape transport, and a winding surface for the tape, and (b) two side flanges associated with the hub, wherein the reel comprises means for non-detachably fastening said side flanges to each other rather than to the hub, and means for firmly holding the hub to the two flanges by mere frictional clamping forces, said first-mentioned



means including structure for welding said flanges to each other to form a welding unit.

4,560,115

EMERGENCY LOCK SAFETY BELT RETRACTOR WITH LOCK-UP RELEASE MECHANISM

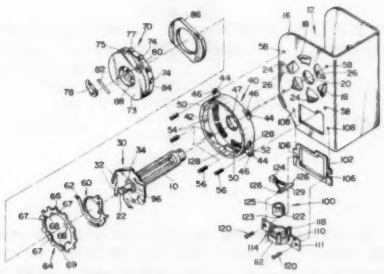
Hiroshige Toyama, Shizuoka; Yoshiyuki Mizuno, Kosai; Yoshimi Yamamoto, Shizuoka, and Mitsuru Kato, Toyohashi, all of Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 593,843

Claims priority, application Japan, Mar. 30, 1983, 58-46354[U]

Int. Cl.[4] A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **27 Claims**



1. An emergency lock safety belt retractor comprising:

a belt spool wound therearound with a webbing;

a first locking member rotatable with said belt spool;

a second locking member normally engageable to said first locking member for rotation with said belt spool, said second locking member movable both in rotational and axial directions;

a third locking member associated with said second locking member for causing the latter to move in the axial direction, said third locking member rotatable with rotation of said belt spool in normal state;

a fourth locking member fixed to a retractor housing and having first and second locking teeth;

a first sensor detecting an inertia exceeding a given magnitude to move from normal state to a locking state, said first sensor including a first pawl engageable to said third locking member for establishing first locking engagement to restrict rotational movement of said third locking mem-

ber, and causing rotational and axial movement of said second locking member toward said first locking member for establishing a second locking engagement of said second locking member with said first locking teeth of said fourth locking member for restricting rotation of said belt spool;

a second sensor detecting rotating speed of said belt spool, said second sensor incorporating a second pawl for establishing a third locking engagement between said second pawl and said second locking teeth of said fourth locking member for establishing said second locking engagement between said second locking member and said fourth locking member for restricting rotation of said belt spool; and

means for allowing said belt spool to rotate in rolling out direction corresponding to a given webbing rolling out stroke after once said second locking engagement being established, in order to disengage said first and third locking engagement so as to release said second locking engagement by subsequent belt spool rotation in rolling in direction.

4,560,116

AXIALLY TELESCOPIC COIL CARRIER PARALLEL TO EACH OTHER

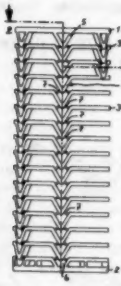
Walter Henning, 1, Hermann-Lons-Strasse, Alsdorf-Hoengen, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 671,405

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 8318224[U]

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—118.11 **9 Claims**



1. Axially compressible lap carrier for taking up threads or yarns comprising: parallel ring elements lying in a common cylindrical or conical winding surface and coupled to one another by deformable tie bars, each ring element having at least two axially protruding bulges distributed over its periphery, each bulge nesting in corresponding bulges of at least one adjoining ring element and the tie bars flexibly connecting the nesting bulges of adjoining ring elements, running at an angle with respect to the axial direction of the lap carrier and displaced radially inwards in relation to the winding surface.

4,560,117

REEL SUPPORTING STRUCTURE IN OPEN REEL TYPE TAPE CASSETTE

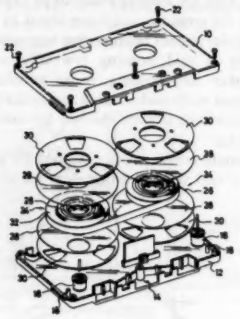
Tokuzo Shimizu, 2-4-7, Tamagawa-Denenchofu, Setagaya-ku, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,114

Int. Cl.[4] B65H *75/14, 75/28;* **G11B** *15/32, 23/04*

U.S. Cl. 242—199 **3 Claims**

1. A tape cassette comprising a set of two front and back cassette halves, each half having a pair of apertures each of which is surrounded by an inward-extending annular projection and is aligned with an aperture and annular projection on the other cassette half, and a pair of tape reels having opposed sides, each of which surrounds two such aligned annular projections, wherein the improvement comprises a pair of inner peripheral steps which extends inward from each reel, and



which is provided with means for engaging a driving shaft, said two aligned annular projections being in supporting engagement with the pair of inner peripheral steps, and the two sides of each reel being separated by a clearance from the two cassette halves.

4,560,118

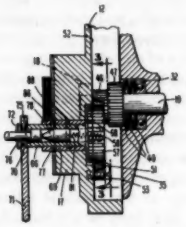
DRIVE MECHANISM FOR FISHING REEL

John A. Weber, and Herbert O. Henze, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Mar. 15, 1984, Ser. No. 589,889

Int. Cl.[4] A01K *89/015*

U.S. Cl. 242—215 **9 Claims**



1. A fishing reel having spaced side plates, a spool interposed between said plates, a spool shaft journaled in a bearing at one end in one of said plates and on which said spool is carried, said spool shaft at its other end being journaled in a bearing carried in said other end plate, and drive means for rotating said spool in one direction comprising:

two gears of different diameter in side by side arrangement fixedly mounted to said spool shaft adjacent said first mentioned end plate;

a stud shaft journaled in a bearing carried by said first mentioned end plate;

a radial arm mounted to said stud shaft by a handle nut;

a crank rod mounted to said arm;

a knob mounted to said crank rod for rotation thereof;

gear means carried by said stud shaft,

said gear means comprising

at least one gear fixedly mounted to said stud shaft,

a rotatably mounted gear means carried by said stud shaft;

ring gear means engaged with said one of said spool shaft gears and with said stud shaft rotatably mounted gear means; and

means for axially positioning said stud shaft for selectively engaging the stud shaft gear with said ring gear, and said other of said gears carried by said spool shaft.

4,560,119

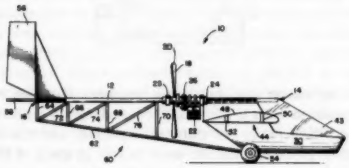
LIGHTWEIGHT AIRCRAFT

Rolf Brand, 212 N. Mecklenburg Ave., South Hill, Va. 23970

Continuation of Ser. No. 492,704, May 9, 1983, abandoned, and a continuation-in-part of Ser. No. 213,458, Dec. 5, 1980, Pat. No. 4,382,566. This application May 29, 1984, Ser. No. 614,772

Int. Cl.[4] B64C *1/16*

U.S. Cl. 244—13 **25 Claims**



1. A lightweight aircraft comprising:

a functionally-continuous, longitudinally-disposed fuselage structure positioned and adapted to carry compression, tensile, bending, and torsional forces of said lightweight aircraft,

an offset wing structure supported by said fuselage structure and positioned in a generally horizontal plane spaced a distance from the generally horizontal plane of said fuselage structure,

a tail assembly mounted on said fuselage structure aft of said offset wing structure,

a propeller means mounted on said load-carrying member between said offset wing structure and said tail assembly for concentric rotation about a longitudinal line of said fuselage structure, said propeller means comprising the sole propelling means for said lightweight aircraft,

an engine means mounted on said fuselage structure,

said engine means creating general aircraft structural torque forces transmitted to said lightweight aircraft and propeller torque forces transmitted directly to said propeller means,

a connecting means positioned outside of said fuselage structure for drivingly connecting said engine means to said propeller means,

an engine direct mounting means positioned on the outside of said fuselage structure adjacent said propeller means for mounting said engine means directly on said fuselage structure,

said engine direct mounting means including a bracket means to which said engine means is attached, and further including a mechanical mounting means for fixedly and directly mounting said bracket means to said fuselage structure,

said mechanical mounting means including a mechanical connection means extending between said bracket means and said fuselage structure for connecting and mechanically engaging and holding said bracket means to said fuselage structure, and

said engine direct mounting means transmitting all said general aircraft structural torque forces directly to said fuselage structure and transmitting substantially all of the weight and torsional forces of said engine means directly to said fuselage structure.

4,560,120

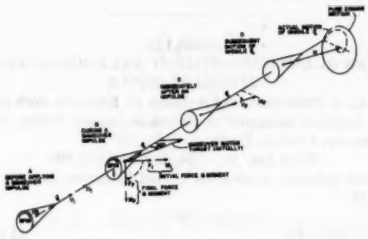
SPIN STABILIZED IMPULSIVELY CONTROLLED MISSILE (SSICM)

James I. Crawford, and W. Max Howell, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 19, 1983, Ser. No. 524,627

Int. Cl.[4] F42B *15/18*

U.S. Cl. 244—3.22 **1 Claim**



1. A method for guiding a missile to a target comprising the steps of spinning said missile so as to provide spin stabilization, utilizing nutational motions of said missile for guidance information, using impulse thrusting which is offset from a center of gravity of said missile for guiding and rotating said missle, spinning the missile at a rate sufficient to provide frequency separation between missile body motion and inertial target motion, utilization filters to separate the target motions from missile body motions, providing impulse thrust with near instantaneous change in lateral velocities, utilizing lateral thrust for maneuvering so as to give a known guidance gain for achieving consistent small misses over a range of intercept conditions, and providing simultaneous impulsive changes in both angular momentum and translational velocity vectors.

4,560,121

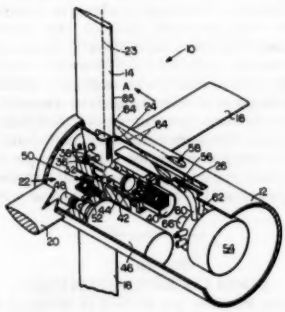
STABILIZATION OF AUTOMOTIVE VEHICLE

Leslie S. Terp, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 17, 1983, Ser. No. 495,375

Int. Cl.[4] F41G *7/00*; F42B *15/02*

U.S. Cl. 244—3.22 **12 Claims**



1. Apparatus comprising a base portion, an aerodynamic fin member pivotally carried by said base portion for selective pivoted control movement relative thereto, said fin member protruding from said base portion into a relatively moving stream of fluid and exerting a significant aerodynamic control force upon said base portion in response to relative pivotal control movement thereof only when the relative velocity of said fluid stream exceeds a predetermined aerodynamic control

threshold value, and cooperating reaction means spaced upstream of said fin member for rendering said fin member effective to exert a significant control force upon said base portion irrespective of said relative fluid stream velocity, said reaction means comprising nozzle means for discharging a reaction jet of elastic fluid toward said fin member, said fin member being foldable forwardly in an upstream direction to a stowed position wherein said fin member does not significantly protrude into said fluid stream, said nozzle means comprising a pair of nozzle members spaced laterally apart on opposite sides of said fin member stowed position.

4,560,122

POWER PLANT ATTACHMENT ARRANGEMENTS FOR AIRCRAFT WINGS

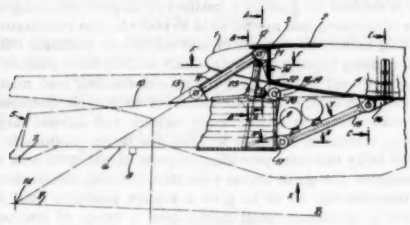
Colin C. A. Parkinson, and Anthony G. Kinnerly, both of Bristol, England, assignors to British Aerospace Public Limited Company, London, England

Filed Jan. 11, 1984, Ser. No. 569,896

Claims priority, application United Kingdom, Jan. 12, 1983, 8300748

Int. Cl.⁴ B64D *27/00*

U.S. Cl. 244—54 **14 Claims**



1. A power plant attachment arrangement for an engine lying generally forward and below an aircraft wing, including a fore-and-aft extending engine-carrying beam member, a spanwise extending wing structural member, and means interconnecting the two, the interconnecting means including a forward element, pin means pinning respective ends of the forward element to the wing structural member and to the beam member such that the forward element extends downwardly and forwardly with respect to the aircraft wing, a rearward element of A-shape in plan, pin means pinning its apex to the wing structural member and pinning laterally spaced regions of its base to correspondingly spaced regions on the beam member such that the rearward element extends downwardly and forwardly with respect to the aircraft wing, and an intermediate element lying between the forward and the rearward elements comprising pin means pinning laterally spaced regions of the beam member to correspondingly spaced regions of the wing member, the axes of the pin means of the forward element, the intermediate element, and the base of the rearward element all lying generally spanwise with respect to the aircraft.

4,560,123

DOOR LOCKING MECHANISM

Francis Sealey, Bellevue, and Richard H. Weiland, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

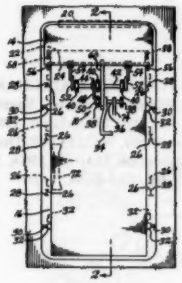
PCT No. PCT/US82/01389, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01340, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1982, Ser. No. 444,400

Int. Cl.⁴ B64C *1/14*

U.S. Cl. 244—129.5 **6 Claims**

1. A mechanism for locking of a top hinged outward opening plug type aircraft door comprising: a door carriage segment hingedly secured to a lintel of an aircraft door opening, a translating door segment having means along the sides to act in conjunction with cooperating means on door frames for holding the door closed when in the locked position, four bar linkages along each side to join the two door segments together, handle actuated linkages to join the two segments



together to move the translating segment between a door locked position to a door unlocked and raised upward and inward position ready for outward opening, and the linkage arranged to place the handle over center at each of the two positions.

4,560,124

RADIO CONVERSION PANEL

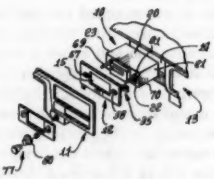
Roger J. Alves, 2538 E. Lynwood St., Simi Valley, Calif. 93065, and Daniel W. Reyes, Northridge, Calif., assignors to Roger J. Alves, Simi Valley, Calif.

Filed Dec. 5, 1983, Ser. No. 557,961

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.⁴ G12B *9/00*

U.S. Cl. 248—27.1 **15 Claims**



1. In a conversion kit for use between a vehicle radio housing and a front trim panel, and adapting to the panel and radio as well as to an instrument panel that receives the radio, the kit comprising

(a) a mounting panel having an opening therethrough to receive a frontwardly projecting portion of the radio housing,

(b) and a multiplicity of generally L-shaped brackets having first legs with attachments to edge portions of the mounting panel to project rearwardly from a plane defined by the mounting panel, the brackets having second legs spaced rearwardly from said plane and extending generally parallel thereto,

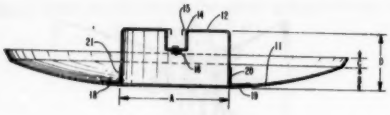
(c) the mounting panel and said brackets consisting of a one-piece unit, attachments of said first legs to said mounting panel edge portions having reduced thickness relative to the thicknesses of the mounting plate edge portions and of the bracket first legs whereby selected brackets may be bent or cut to sever their attachments to the mounting plate so that remaining brackets may be employed to secure the mounting plate in position.

4,560,125

SUPPORTING APPARATUS FOR PIPELINES SYSTEMS

Dale N. Hess, Colorado Springs, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,541
Int. Cl.[4] F16L 3/16
U.S. Cl. 248—55 **19 Claims**



1. Apparatus for supporting a pipeline above the ground, comprising:

a base member having a substantially flat central surface surrounded by an upwardly sloping arcuate surface;

a support section rigidly attached to and extending upwardly from said central surface of said base member and having an upper surface extending parallel to said flat central surface of said base member, said upper surface having a channel extending across it; and

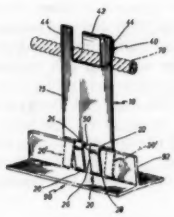
pipe support means rigidly coupled to said channel to support a portion of said pipeline whereby said flat central portion of said base member is free to move as the pipeline moves but does not move relative to it.

4,560,126

CONDUIT SUPPORT BRACKET AND METHOD FOR SUPPORTING AN ELONGATED MEMBER

Milton W. Judkins, Bellaire, and Arthur C. Williams, Spring, both of Tex., assignors to Electrical Hardware, Inc., Garland, Tex.

Continuation of Ser. No. 352,709, Feb. 26, 1982, abandoned. This application May 29, 1984, Ser. No. 615,089
Int. Cl.[4] F16L 3/24
U.S. Cl. 248—72 **8 Claims**



1. A plurality of support brackets suitable for use in combination with each other for supporting an elongated member along a desired path above a dropped ceiling, each bracket comprising:

a central strip of deformable, semi-rigid sheet material;

means extending from one end of said strip for gripping a flange to attach the bracket above a dropped ceiling; and

a cradle at the opposite end of said central strip of material for receiving and positioning a section of an elongated member along an axis essentially parallel to the central strip of material, the cradle being formed to extend outwardly away from the central strip of material sufficiently to receive the elongated member and then in general parallel relationship to the central strip; and

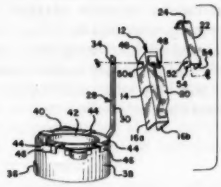
at least one retaining tab adjacent said cradle, said tab being smaller in width than said cradle and being adapted to be manually bent around said elongated member, so that the plurality of brackets support the elongated member along a desired path.

4,560,127

PAINT CADDY

Vincent A. Ippolito, 5442 W. Parker, Chicago, Ill. 60639

Filed Mar. 18, 1983, Ser. No. 476,514
Int. Cl.[4] E06C 7/14
U.S. Cl. 248—210 **1 Claim**



1. A device for supporting and leveling a paint can from either side of a ladder comprising:

a support assembly including a U-shaped channel section having two spaced-apart side panels joined by an essentially perpendicular central portion positionable against a side rail of a ladder;

first and second bolts attached respectively to a selected region of each of said side panels so as to extend laterally from the side rail of the ladder;

a hook member adapted at an end thereof to pivotally receive one of said bolts to form a pivotable assembly and to engage a rung of the ladder thereby releasably supporting said assembly;

an elongated L-shaped arm adapted at a first end thereof to pivotally receive one of said bolts;

a cylindrical paint can receiver with an open top supported by a second end of said L-shaped arm with an upturned flange formed at said second end positioned adjacent to and affixed to said paint can receiver; and

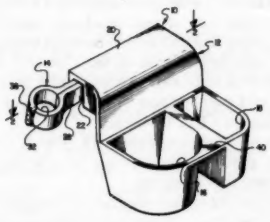
a removable collar member insertable through said top of said receiver and having arms extending therefrom for releasably engaging said top thereby centrally positioning said collar therein so as to block radial movement of a can of paint placed within said collar member and supported by said receiver.

4,560,128

DRINK HOLDER

Randy C. Willeby, Star Rte. and Box 313, Bakersfield, Calif. 93306, and Kenneth L. Wheeless, 329 N. Prospect Ave., Porterville, Calif. 93257

Filed Aug. 3, 1984, Ser. No. 637,268
Int. Cl.[4] A47C 7/62
U.S. Cl. 248—230 **2 Claims**



1. A drink holder to be mounted on a substantially vertical tubular member, said drink holder comprising:

a housing adapted to support a separate drink container, said housing having an elongated open-sided slot; and

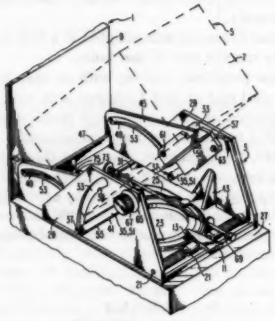
a bracket, said bracket being formed of a first leg member and a second leg member, said first member being pivotally attached to said housing, said second leg member being pivotally attached to said first leg member, said second leg member being pivotable between a closed position in juxtaposition with said first leg member to an open position oriented transverse to said first leg member, with said leg members in said closed position forming an opening, said tubular member adapted to be located within said opening, with said first and second leg members in said closed position being locatable within said open-sided slot, said second leg member being movable to said open position only when said leg members are displaced from said open-sided slot.

4,560,129

TILTING APPARATUS FOR A VIEWFINDER OF A CAMERA

Richard W. Clayton, Medford, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 27, 1984, Ser. No. 604,975
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—278 **14 Claims**



1. Apparatus comprising:

a main chassis including a side having a cam surface;

a subchassis inside said main chassis including a side substantially parallel to said side of said main chassis and rotatably coupled thereto, said side of said subchassis having first and second cam surfaces; and

a carriage inside said subchassis including a side substantially parallel to said side of said subchassis, said side of said carriage having first and second bearings engaging respective first and second cam surfaces of said side of said subchassis so as to be moved with respect to said subchassis along said cam surfaces of said subchassis to position said carriage in a first tilt sense;

said subchassis being rotatable with respect to said main chassis to position said carriage in a second tilt sense opposite said first tilt sense;

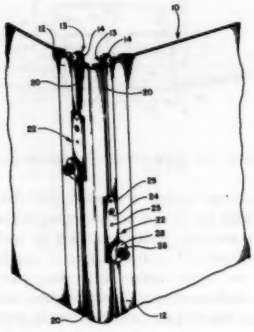
said second bearing of said carriage also engaging said cam surface of said main chassis so as to be moved along said cam surface of said main chassis when said subchassis is rotated with respect to said main chassis to maintain said carriage in a rest position with respect to said subchassis.

4,560,130

TRACK BOLT FASTENER

Wesley W. Schwartz, Oshkosh, Wis., assignor to Square D Company, Palatine, Ill.

Filed Dec. 10, 1984, Ser. No. 679,774
Int. Cl.[4] A47F *1/10*
U.S. Cl. 248—297.2 **13 Claims**



1. Apparatus for moveably mounting a utility item along a track, said apparatus comprising:

a bolt having an outer threaded portion at one end;

an opening in said threaded end; a pin moveably mounted in said opening; a spring disposed between the pin and the bolt in said opening such that said spring constantly urges the pin out of the opening; means for maintaining said pin in said opening;

a relatively planar support panel having an opening for receiving the bolt therethrough and means for mounting said utility item thereto;

a retaining member threaded onto the outer threads of the bolt on one side of the support panel; a nut threaded onto the outer threads of the bolt on the other side of the support panel;

a track having an inner area and an outer elongated opening joining the inner area; such that said retaining member is insertable at any point on the track through the elongate opening and turnable with said bolt by compressing the bolt and pin against an inner wall of the inner track area to engage the inner track area with the retaining member, such that when so engaged the nut may be tightened against the other end of the support panel thereby tightening the support panel to the track and causing the entire assembly to remain on the track at a predetermined location.

4,560,131

ANCHOR STAND

Leonard F. Eck, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Sep. 29, 1983, Ser. No. 537,019
Int. Cl.[4] B21D *1/12*
U.S. Cl. 248—352 **3 Claims**

2. An anchor stand for securing a vehicle and for use in combination with an anchor installed in a floor comprising:

(a) a stand including spaced legs, a lower floor engaging portion and an upper portion;

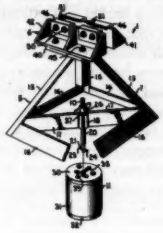
(1) said stand being substantially frusto-pyramidal in shape, said shape being square pyramidal and said legs forming substantially vertical edges of said pyramidal stand;

(2) said lower floor engaging portion including a base of said pyramid and a central bushing;

(b) clamp means mounted on said upper portion of said stand for engaging and supporting a vehicle on said stand;

(1) said clamp means including opposing jaws, a plate and engagement pads; said plate being substantially horizontally disposed, and adapted for selective positioning of said jaws thereon, thereby allowing selective engagement of said engagement pads with a pinch weld of a vehicle;

(c) a bolt member mounted in and extending downwardly through said central bushing and having an upper head means associated therewith for grasping and rotation and



a lower anchor engagement means for mounting said stand to the anchor;

(1) said bolt member being a threaded bolt;

(2) said lower anchor engagement means being a pair of posts extending from said bolt being received by and selectively engaging with the anchor;

(3) said head means being a nut threadably received on said bolt and permitting selective tightening and drawing of said stand into engagement with the anchor.

4,560,132

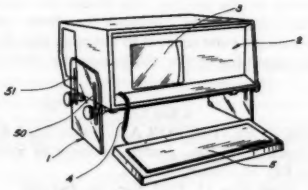
STAND FOR DISPLAY DEVICES

Leslie N. Wilder, 150 Jennie La., Fairfield, Conn. 06430

Filed Oct. 11, 1984, Ser. No. 659,768

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—396 **11 Claims**



1. A stand for support of display device, said stand comprising:

a. a first side support means having a first generally vertical slot formed therein, one face of said slot being generally smooth and one face of said slot being provided with serrations, and a second slot, one face of said slot being generally smooth and one face of said slot being provided with serrations;

b. a second side support means having a first generally vertical slot formed therein, one face of said slot being generally smooth and one face of said slot being provided with serrations, and a second slot, one face of said slot being generally smooth and one face of said slot being provided with serrations;

c. a first equipment support member including a rod having first and second ends extending through said first slot of said first side support means and said first slot of said second side support means, the serrated face of each slot facing in the same direction, a first gear mounted on a first end of said rod and engaging the serrations of said first slot in said first side support means and a second gear mounted on the second end of said rod and engaging said serrations in said first slot in said second side support means, and means mounted on at least one end of said rod, outwardly of said side support means, for movement of said equipment support member;

d. a second equipment support member including a second rod having first and second ends extending through said second slot of said first side support means and said second slot of said second side support means, the serrated face on each slot facing in the same direction, a third gear mounted on the first end of said second rod and engaging the serrations of said second slot in said first side support means and a fourth gear mounted on the second end of said second rod and engaging said serrations in said second slot in said second side support means, and means mounted on at least one end of said second rod, outwardly of said side support means, for movement of said equipment support member; and

e. a cylindrical member being mounted on each rod member, said cylindrical member being held in place by a first bushing at each end, said first bushing abutting and lying inwardly of each side support, each said first bushing being provided with projecting portions adapted to engage within the associated slots.

4,560,133

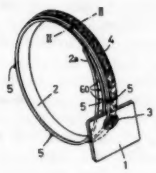
DISPLAY UNIT FOR JEWELRY ARTICLES

Francois Droz, La Chaux-de-Fonds, Switzerland, assignor to Brevex Georges Claude S.A., La Chaux-de-Fonds, Switzerland

Filed Aug. 26, 1982, Ser. No. 411,888

Int. Cl.[4] A47F *7/02*

U.S. Cl. 248—442 **12 Claims**



1. A display unit for a jewelry article, such as a wrist watch, bracelet, ring or necklace, in order to support the displayed article in a raised position on a shelf of a display window, comprising:

a small plate capable of carrying data concerning the display article;

a band rigidly connected at one end region thereof with said small plate;

said band having a free end portion located at an opposite end of said band remote from said one end region;

said band being fabricated of a flexible material having good elasticity;

said band being selectively positionable from a rest position where it does not support the article to be displayed into an operative position where it is capable of supporting the article to be displayed;

said band in said rest position being substantially rectilinear in its configuration; and

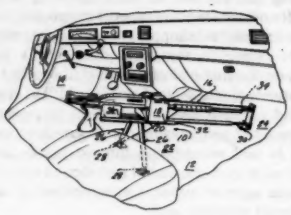
said band being sufficiently flexible and forming in said operative position a loop with said free end portion of said band directly and circumferentially engaging a predetermined portion of said band at an inner surface thereof such that said loop is capable of being applied against an internal face of the article which is to be displayed so as to be capable of supporting said article in a desired display position.

4,560,134

ADJUSTABLE GUN RACK FOR AUTOMOTIVE PASSENGER COMPARTMENTS

John M. Klein, 5100 Wah Ta Wah, Clarkston, Mich. 48016

Filed Sep. 1, 1983, Ser. No. 528,583
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—511 **20 Claims**



1. A gun rack providing an adjustable support for mounting long guns on the floor tunnel of automotive passenger compartments comprising:

an elongated main support member;

a pair of leg assemblies mounted along said main support member, said leg assembly including means mounting one end of each of said leg members to said main support member, said means allowing independent adjustment of the relative angular position of each of said legs with respect to said main support member;

a mounting platform secured to said main support member and adapted to mount a locking assembly configured to receive and retain a long gun therein;

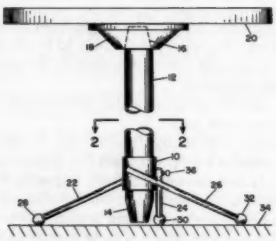
mounting means carried by the other end of each of said leg assemblies, and on a front end of said main support member offset from said leg assemblies, each of said mounting means comprising a mounting plate and pivot means pivoting each of said mounting plates to each other end of each leg assembly and front end of said main member respectively, said pivot means for said mounting plate carried by said front end of said main member allowing both up and down and side to side pivoting movement of said mounting plate, said side to side pivoting movement being substantially unlimited to enable disposition of said mounting plate substantially perpendicularly and along one side of said front end of said main support member to be able to be fastened against a side surface of said tunnel contour, whereby adjustable three point support of said main support member on a tunnel contour is enabled.

4,560,135

CONVERTIBLE TABLE SUPPORT

Donald C. Mestler, 5 Potter Ct., Smithtown, N.Y. 11787

Filed Jul. 31, 1984, Ser. No. 636,305
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—558 **5 Claims**



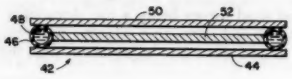
1. Support apparatus, for use with a table arrangement including a table top having a tapered receiving socket mounted on one side and a cylindrical table support tube having identical tapered ends for insertion into said table top socket and another socket, comprising a cylindrical collar having an axis and a central axial bore arranged to surround said tube, said collar having means for engaging said tube to axially fix said collar on said tube and having first and second axial ends, and support means attached to and extending radially and axially outward from said collar, said support means extending axially from one of said axial ends by a distance that exceeds the axial length of said receiving socket and extending radially from said collar by a distance that exceeds the radial size of said receiving socket to provide stable free-standing support for said tube, said support apparatus having a concave open area, bounded by said collar and said support means, which is larger than said receiving socket, whereby when said support apparatus is axially fixed to said table support tube a selected distance from one end, with said support means extending axially beyond said one end, said one end may be received in said receiving socket without said support means interfering with said table top.

4,560,136

SUPPORT FOR HI-FI TURNTABLE BASE

William T. Basore, 1610 Berkshire Dr., Stillwater, Okla. 74047

Continuation of Ser. No. 338,338, Jan. 11, 1982, abandoned. This application Apr. 1, 1985, Ser. No. 718,819
Int. Cl.⁴ F16F *15/08*
U.S. Cl. 248—559 **5 Claims**



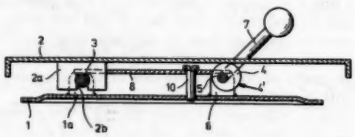
1. In a vibration isolating apparatus for turntables the specific improvement comprising: support means comprising a base member, a single fluid filled endless tube freely disposed on the upper surface of the base means, floating support plate means independent of the base member and yieldably supported directly on the endless tube means for receiving the turntable thereon to isolate vibrations therefrom, and weight means comprising a plate secured to the inner periphery of the endless tube means for further dissipating the vibrations.

4,560,137

POSITIONING DEVICE FOR A SUPPORTED ARTICLE

Rudolf Svoboda, St. Pölten, Austria, assignor to Svoboda Entwicklungs KG, St. Polten, Austria

Filed May 11, 1983, Ser. No. 493,643
Claims priority, application Austria, May 11, 1982, 1848/82
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—652 **12 Claims**



1. A rapid action device for adjusting the position of a load with respect to a surface, comprising:

a pair of plates, the first of which is adapted to rest upon said surface and a second of which is adapted to receive said load;

means defining a pivot interconnecting said plates;

a shaft journaled directly on one of said plates and disposed between said plates parallel to said pivot;

means including a handle located outside of the outlines of said plates and operable from a location externally of said plates engaging said shaft for rotating same;

an eccentric carried by said shaft rotatable therewith and having an eccentric surface directly bearing only upon the other of said plates and spaced from said one of said plates for urging said plates apart upon rotation of said shaft in one sense; and

friction brake means engaging said shaft for resisting rotation thereof at least in the opposite sense, said friction brake means including a flat spring plate between said first and second plates and bearing against said shaft, said spring plate being attached at one end to said one of said plates, and

adjusting means being said first and second plates including a screw at an opposite end of said spring plate and engaging said one of said plates for varying the force with which said spring plate bears against said shaft.

4,560,138

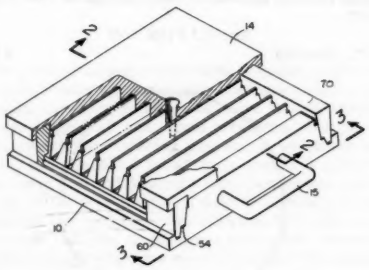
ENCAPSULATION MOLD

Gaston D. dePuglia, 13 Seascape Ct., Brookings, Oreg. 97415; William J. Van der Borght, 8348 Riesling Way, San Jose, Calif. 95135, and Max Moitzger, North Spud Island, Stockton, Calif. 95209

Filed Nov. 25, 1983, Ser. No. 555,147

Int. Cl.[4] B29C *1/00*; **B29D** *3/00*

U.S. Cl. 249—95 **16 Claims**



1. A mold comprising:

(a) a lower mold section having spaced upwardly-projecting inclined planar walls defining a plurality of upwardly-opening longitudinally-extending recesses, said walls providing respectively article holder inclined planar engaging surfaces on which article holders are disposed respectively in inclined planes, said lower wall mold section comprising means disposed between each confronting pair of inclined planar article holder engaging surfaces for supporting at least one article holder;

(b) an upper mold section having a plurality of downwardly-directed longitudinal walls adapted to be moved into the recesses of said lower section in interdigitating relation and cooperating with the walls of said recesses to define a plurality of longitudinal runners; and

(c) means defining an inlet passage in said upper mold section, and means providing flow communication between said inlet passage and said longitudinal runners.

4,560,139

BAKERY PROOFER APPLIANCES

William R. Dahlke, c/o Aeromat Plastics, Box 52828, Lafayette, La. 70505-2828

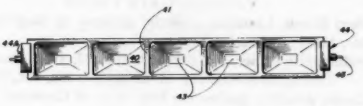
Continuation-in-part of Ser. No. 429,496, Sep. 30, 1982, abandoned. This application Jan. 20, 1984, Ser. No. 572,507

Int. Cl.[4] B28B *7/36*

U.S. Cl. 249—112 **8 Claims**

1. A lightweight, longitudinally elongated, hollow proofer tray comprising in combination;

a longitudinally elongated hollow housing having top bottom and end walls formed of a continuous layer of material impervious to the environmental conditions encountered in a proofing chamber, said hollow housing exhibiting a continuous outer surface characterized by smooth, crevice free transitions intermediate non-parallel portions thereof and culminating in a pair of vertically extending horizontally spaced apart inner and outer end walls at opposite ends of said housing, an upper surface extending intermediate said inner end walls and including a plurality of longitudinally spaced apart dough receiving pockets and a lower surface extending intermediate said outer end



walls and the sides of said upper surface and extending downwardly therefrom to enclose the undersides of said end walls, upper surface and pockets in cooperative mutually supportive relationship, and including an integrally molded receptacle having a peripheral cylindrical wall connected to and disposed to extend intermediate opposed interiorly disposed sides of each of said pair of inner and outer end walls at a location above said upper surface, for rotably mounting said tray, thereby providing a lightweight hollow structure that is self supporting and is further characterized by providing a crevice-free, continuous outer wall and a sealed, contaminant free interior.

4,560,140

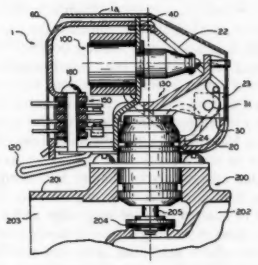
ZONE CONTROL VALVE

Michael D. West, Arlington Heights, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,579

Int. Cl.[4] F16K *31/00*

U.S. Cl. 251—11 **14 Claims**



1. An operator unit for a zone valve, said operator unit comprising:

a heat motor;

a lever movable by said heat motor to control a said valve; and

a frame supporting said heat motor and said lever, said frame comprising:

a first frame piece having a first portion having an aperture for receiving a valve unit, and having a first tongue receiving groove, a second portion extending over said first portion, a third portion between and connecting said first and second portions, and a fourth portion extending from said second portion parallel to said first portion, said fourth portion having a second tongue receiving groove;

a second frame piece having a first tongue at one end adapted to engage said first groove and a second tongue at its other end adapted to engage said second groove;

a third frame piece having a first portion extending perpendicular to said first frame piece first portion, one of said

first frame piece first portion or said third frame piece first portion having a least one tongue and the other having at least one corresponding groove adapted to receive said at least one tongue, and second portion extending approximately parallel to said first frame piece first portion, one of said third frame piece second portion and said first frame piece having at least one tongue and the other having at least one corresponding groove adapted to engage said at least one tongue.

4,560,141

VACUUM GATE VALVE

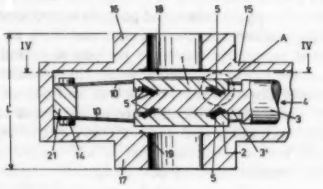
Hubert Bösch, Lustenau, Austria, assignor to Siegfried Schertler, Haag, Switzerland

Continuation of Ser. No. 506,668, Jun. 22, 1983, abandoned. This application May 15, 1985, Ser. No. 734,755

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224387

Int. Cl.⁴ F16K *25/00*

U.S. Cl. 251—167 **1 Claim**



1. A vacuum gate valve including first means forming a valve seat **(18)** encircling an opening with a valve axis extending centrally through the opening, a first valve plate **(1)** and a second valve plate **(2)** each having a first surface facing a first surface on the other and an oppositely directed second surface with said first and second surfaces extending transversely of the valve axis, second means located between the first surfaces of said first and second plates for displacing the first surfaces so that they move toward and away from one another and when they are moved away from one another the second surface of said first plate is pressed into sealing contact with said valve seat for placing said valve in the closed condition, and when they are moved toward one another said valve is in the open condition, said second means includes an actuating member **(3)** arranged for movement transversely of the axial direction of the valve axis for effecting the displacement of said first and second plates in the direction of the valve axis, said second means includes rectangularly shaped spreading members **(5)** elongated in one direction as compared to the other each having a pair of spaced parallel long sides and a pair of spaced parallel short sides extending between the opposite ends of said long sides and where said long sides are significantly longer than said short sides, some of said spreading members being pivotally supported in contact with said actuating member and the first surface of said first plate and the others being pivotally supported in contact with said actuating member and the first surface of said second plate, said actuating member having a pair of oppositely facing third surfaces with each said third surface facing a different one of said first surfaces on said first and second valve plates, each of said first surfaces and third surfaces having a first contact surface **(6)** and a second contact surface **(7)** contiguous to said first contact surface and said first and second contact surfaces extending angularly relative to one another at an angle greater than a straight angle, the intersection of said first and second surfaces forming a rectilinear line of intersection **(12)**, and said first and second contact surfaces in each said first surface being located opposite said first and second contact surfaces in the opposite third surface of said actuating member, said long sides of said spreading members extend between said first surfaces on one of said first and second valve plates and said third surfaces on said actuating member in the open condition and in the closed condition of said valve, said short sides **(8,9)** of said spreading members contact said first contact surfaces **(6)** in the open condition of said valve and extend obliquely of the valve axis and contact said second contact surfaces **(7)** in the closed condition of said valve and extend substantially perpendicular to the valve axis, and during the movement of said first valve plate **(1)** between the closed and open conditions of said valve a line extending across each of said short sides of said spreading members **(5)** is disposed in contact with and pivots about the corresponding intersecting line **(12)** between said first and second contact surfaces **(6,7)** out of contact with said first and second contact surface and pivots between the open condition of said valve when said long sides of said spreading members **(5)** form an acute angle with the first surfaces of said first and second valve plates and the third surfaces of said actuating member and the closed condition of said valve when the long sides of said spreading members extend substantially perpendicularly to the first surface of said first and second valve plates and the third surface of said actuating member, and in the closed condition said second contact surfaces **(7)** support at least half of the width of said short sides **(8,9)**.

4,560,142

BUTTERFLY AND BALL VALVES

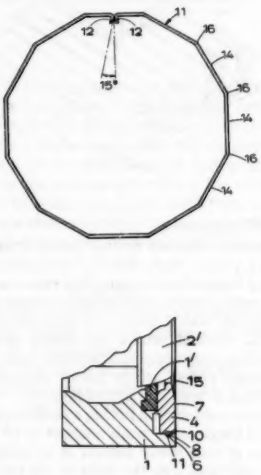
Philip J. Burton, Birmingham, England, assignor to Charles Winn (Valves) Limited, Birmingham, England

Filed Nov. 8, 1983, Ser. No. 549,993

Claims priority, application United Kingdom, Nov. 12, 1982, 8232437

Int. Cl.⁴ F16K *1/46*

U.S. Cl. 251—306 **8 Claims**



1. A valve assembly comprising a valve housing member defining a through-flow passage, a rotatable valve element positioned in said passage, an annular valve seat assembly positioned in said housing member for engagement with said valve element and encircling said passage, a seat retaining ring member positioned axially adjacent to said seat assembly for clamping said seat assembly in use to said valve housing member, a radially inwardly facing surface of said valve housing member being formed with an annular first groove, a radially outwardly facing surface of said seat retaining ring member being formed with an annular second groove confronting said first groove, and a wire ring holding captive said seat retaining ring member to said valve housing member, said wire ring comprising larger radius portions alternating circumferentially

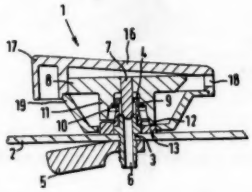
with smaller radius portions, said larger radius portions being received substantially within said first groove, and said smaller radius portions being received substantially within said second groove, one of said members being formed in the respective one of said surfaces with a substantially helical lead-in groove connecting with the respective one of said annular grooves provided in said one member and so arranged as to enable assembly together of said members by a relative screwing action of said members when said wire ring is mounted on the other of said members.

4,560,143

PRESSURE COOKER RELIEF VALVE ASSEMBLY

Geoffrey Robinson, Burnley, England, assignor to The Prestige Group PLC, London, England

Filed Apr. 9, 1984, Ser. No. 597,988
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—338 **6 Claims**



1. A pressure cooker relief valve assembly comprising: a valve port; a valve member; a valve seating; a weight assembly that urges the valve member and valve seating together to close the valve port; and means preventing rotation of the weight assembly by escaping gas; and in which the weight assembly includes: a first substantially annular wall surrounding the valve port and defining a first chamber into which gas from the valve port empties; a second substantially annular wall spaced from and concentric with said first wall and defining a second chamber, there being a passageway between said chamber through which gas moves from said first chamber to said second chamber; and an opening in said second wall through which gas escapes from said second chamber in a generally predetermined direction.

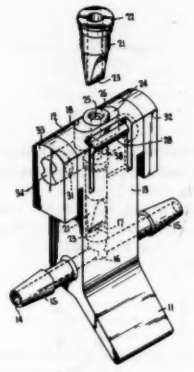
4,560,144

FLUID COUPLING DEVICE

Rodger W. Williams; Charles W. Atwood, and Lawrence J. Morgan, all of Nashville, Tenn., assignors to Vxtra Corporation, 700 Division, Nashville, Tenn.

Continuation-in-part of Ser. No. 607,453, May 7, 1984, abandoned. This application Mar. 12, 1985, Ser. No. 710,961
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—344 **27 Claims**

1. For use in a receptacle having an inwardly facing wall open at one side and a fluid conductor terminating at an opening in said wall, a fluid coupling device having a flow passage formed therethrough, the coupling device being insertable in the receptacle through said open side and being movable when so inserted between an open position establishing communication between the fluid conductor and the flow passage, and a closed position disconnecting the fluid conductor from the flow passage, wherein the coupling device comprises a spindle member formed with an opening communicating with the flow passage, engagement means on the spindle member for engaging corresponding means on the receptacle in a manner precluding axial rotation of the spindle member, a body member rotatably mounted on the spindle member, the body member defining a receiving pocket communicating with a part of the spindle member containing said opening, a cam seat insert member received in said pocket, the cam seat insert member having an inner wall for engaging an outer surface of the spindle member, an outer wall projecting from the body member, a through passage extending between said walls, and a resilient annular sealing rim on the outer wall around said passage, and wherein said surface of the spindle member is formed as a cam surface for urging the cam seat insert member



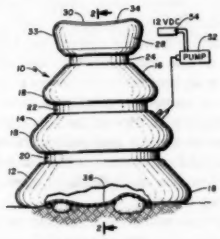
outwardly when the body member is rotated around the spindle member from the closed position to the open position aligning the through passage in the cam seat insert member with the respective openings in the spindle member and receptacle and compressing the sealing rim around the opening in the receptacle.

4,560,145

AIR BAG JACK

Stanley W. Widmer, Sylvan Shores, Fawn Lake Dr., Brownerville, Minn. 55438

Continuation-in-part of Ser. No. 28,114, Apr. 9, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,867
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 HP **6 Claims**



1. An air bag jack comprising:

an inflatable member made from a flexible, elastomeric material an[4] having a wall with a substantially uniform thickness and having a top section, and a plurality of lower sections, all of the sections being integral with each other to form an airtight enclosure, the sections being nestable into the next lower section and each having a maximum base diameter smaller than the maximum base diameter of the section immediately below, the sections being joined to the next lower section by a neck portion;

a plurality of expandable elastic rings, each ring surrounding the neck portion of the flexible member between two adjacent sections and being of smaller diameter than the maximum base diameter of both of such two adjacent sections, said elastic rings expanding a controlled amount

as the inflatable member is inflated for use to control elastic deformation of the inflatable member where the sections are joined thereby to provide yieldable size control for the adjacent sections as the member is inflated; and means for introducing a pressurized fluid into the interior of said inflatable member.

4,560,146

STRIPPER ASSEMBLY FOR REMOVING CARPET

Philip D. Thomas, and Harvel W. Thomas, both of 10471 SW. 40 Ter., Miami, Fla. 33165

Continuation-in-part of Ser. No. 505,298, Jun. 17, 1983, Pat. No. 4,533,118. This application Jun. 22, 1984, Ser. No. 623,517

Int. Cl.⁴ B66D *1/00*

U.S. Cl. 254—202 **17 Claims**

1. A stripper assembly primarily designed to remove carpeting of the type directly adhered to a floor or like surface, said stripper assembly comprising:

(a) gripping means structured for secure attachment to a portion of a carpet being stripped and a driving means interconnected to said gripping means,

(b) interconnecting means comprising a cable attached substantially at one end thereof to said gripping means and mounted at an opposite end thereof to said driving means, said driving means including a support base and a power driven winch mounted on said support base, said winch connected to driving and pulling relation to said cable, said winch and said cable disposed and structured to exert a pulling force on said gripping means upon activation of said driving means,

(c) anchor means movably connected to said driving means and adjustably positioned relative to an anchoring carpet portion adjacent said driving means, said anchor means structured for secured positioning of said driving means relative to the anchoring carpet portion,

(d) said anchor means comprising a base means and teeth means attached to said base means and extending outwardly from an undersurface thereof into penetrating relation to the anchoring carpet portion, and

(e) said base means movably attached to said support base and selectively positionable between an anchoring position and a stored position, said anchoring position defined by an outwardly extending disposition of said base means relative to said support base and penetrating engagement of said teeth means with the anchoring carpet portion; said stored position defined by orientation of said base means in substantially totally supported relation on said support base.

4,560,147

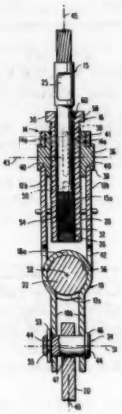
LOW PROFILE STRAP TYPE TURNBUCKLE WITH LOAD BEARING ARTICULATED NUT

Brian L. Bowdren, Annapolis, Md., assignor to Bowdren, Inc., Annapolis, Md.

Filed Jan. 23, 1985, Ser. No. 694,196

Int. Cl.⁴ B66F *3/00*

U.S. Cl. 254—231 **8 Claims**



1. A lightweight, low profile turnbuckle for applying tension between a shroud or stay and chain plate or the like of a sailing yacht joined by said turnbuckle, said turnbuckle comprising:

a U-shaped metal strap comprising a circular center section, integral paired arms extending outwardly of said center section generally parallel to each other, permitting said circular center section to rotatably bear a pin and forming a first articulated connection between one of said chain plate and said shroud or stay,

a load bearing articulating nut mounted between said strap arms remote from said strap center portion for rotation about an axis perpendicular to the longitudinal axis of said strap,

a cylindrical adjustment sleeve bearing opposite threads on interior and exterior surfaces thereof,

said nut including a threaded bore threadably receiving said adjustment sleeve,

a stud operatively connected to one of said shroud or stay and said chain plate and terminating in a threaded end having threads compatible with the internal threads of said sleeve and being threaded internally of the sleeve such that rotation of said adjustment sleeve causes said sleeve and said threaded end of said stud to move axially through said nut in the direction of said center portion of said strap to apply tension between said chain plate and said shroud or stay as said adjustment sleeve rotates on said threaded end of said stud and internally of said nut.

4,560,148

LOG SKIDDER VEHICLE BRAKE SYSTEM

Marvin K. Palmer, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00353, § 371 Date Mar. 22, 1982, § 102(e) Date Mar. 22, 1982

PCT Filed Mar. 22, 1982, Ser. No. 648,235

Int. Cl.⁴ B66D *1/08*

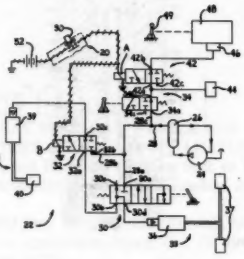
U.S. Cl. 254—323 **6 Claims**

1. A log skidding vehicle brake system (22) comprising:

a plurality of ground engaging members (12);

a transmission (48) for transmitting power to said ground engaging members (12);

a source (24) of pressurized fluid;
means (38) for braking movement of said ground engaging members (12), said braking means (38) being actuatable by pressurized fluid;
first means (30) for selectively transmitting pressurized fluid between said fluid source (24) and said braking means (38);
second means (32) for selectively transmitting pressurized fluid between said fluid source (24) and said braking means (38);



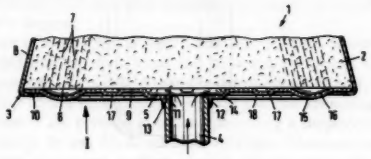
means (46) for shifting said transmission (48) to neutral;
a winch (18) for selectively retracting and extending a cable; and
means (20) for actuating said winch (18), said winch actuating means (20) including a displaceable lever (20) having mounted thereon means (50) for simultaneously actuating said second fluid transmitting means (32) and said transmission shifting means (46).

4,560,149

GAS BUBBLE BRICK FOR METALLURGICAL VESSELS

Hans Höffgen, Im Silbertal 13, 5410 Höhr-Grenzhausen, Fed. Rep. of Germany

Filed Oct. 24, 1984, Ser. No. 664,439
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341491
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—220 7 Claims



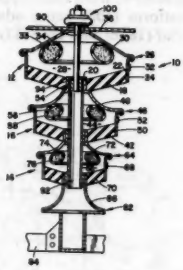
1. Gas bubble brick for metallurgical vessels consisting of a gas-permeable shaped brick which can be installed in the wall or the bottom of the vessel and having directed porosity, which is designed in a ring region of the shaped brick, a gas-tight metal casing partially surrounding the shaped brick and welded together from a metal jacket extending around the lateral circumferential area of the shaped brick and a metal cover covering the outer face of the shaped brick, as well as a gas supply pipe, which is welded onto the rim of a central gas inlet orifice of the metal cover, characterised in that an annular collecting chamber (16) is provided in front of the inlet cross-section of the region (6) having directed porosity, and in that the connecting area of the gas supply pipe (4) is joined to the annular collecting chamber (16) via at least one joining channel (17).

4,560,150

DRY VISCOUS SPRING STRUT

Emile M. Shtarkman, Cleveland, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Nov. 25, 1983, Ser. No. 554,905
Int. Cl.[4] B60G *11/62*; F16F *13/00*
U.S. Cl. 267—35 12 Claims



1. A dry viscous spring strut for damping and leveling structural agitation comprising:
a first outer housing, a second outer housing and an inner housing intermediate of said first and said second outer housings;
said first outer housing including a first elastomeric shear spring;
said second outer housing including a second elastomeric shear spring;
said inner housing having an inner elastomeric shear spring joining said inner housing to said second outer housing;
at least one of said housings having a selectively pressurizable gas chamber;
at least one of said housings having a particle chamber including a plurality of elastomeric particles; and,
a mating rod and tubing assembly to restrict said strut to generally relative axial motion only between said first and second outer housings whereby relative movement between said housings operates to stress said shear springs and said elastomeric particles and adjust pressurization of said particle and gas chambers.

4,560,151

TRANSMISSION MOUNTING STAND

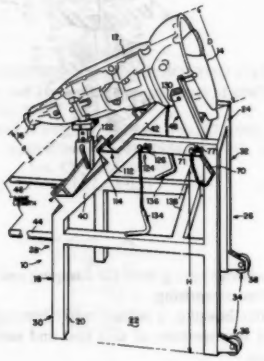
Leslie R. Grundy, 1190 Theresa Ave., Campbell, Calif. 95008

Filed May 30, 1984, Ser. No. 615,145
Int. Cl.[4] B66F *5/04*
U.S. Cl. 269—17 6 Claims

1. A stand (10) for selectively positioning a case (12) which has a wider end portion (14) having generally a width, d, and a narrower end portion (16) having generally a width, d, comprising:
a rigid frame (18) having a bottom portion (20) adapted to sit on a floor (22), a top portion (24), a front portion (26), a rear portion (28), a left side portion (30) and a right side portion (32);
a yoke (48) having a yoke crossbar (50) having opposite ends (52,54) and a pair of side bar structures (56,58) each extending generally in a first direction from a respective one of said opposite ends (52,54) to respective end portions (60,62) a distance, L, which is greater than or substantially equal to D/2, from said yoke crossbar (50);
yoke supporting means (68) for supporting said yoke crossbar (50) from said left side portion (30) to said right side portion (32) adjacent said front portion (26) of said frame (18) and a distance, H, above said floor (22);
means (80) for releasably attaching said wider end portion

(14) of said case (12) between said remote end portion (60,62) of said side bar structures (56,58) of said yoke (48);

a support structure (86) having a support crossbar (88) having opposite end portions (90,92) and a support bar structure (94) having a first end (96) attached to said support crossbar (88) intermediate said opposite end portions (90,92) and a second end (98) having a support platform (100) a distance, l, from said support crossbar (88), said support platform (100) being adapted to support said narrower end (16) of said case (12);



first support means (112) for supporting said support crossbar (88) from said left side portion (30) to said right side portion (32) with said support platform (100) generally vertically above said support crossbar (88) intermediate said front portion (26) and said rear portion (28) at a distance, h, above said floor (22); and

wherein said case (12) can be supported generally horizontally by said yoke (48) and said support structure (86); and

supporting means (124) for supporting said respective end portions (60,62) of said pair of side bar structures (56,58) of said yoke (48) in substantially horizontal relation to said yoke crossbar (50).

4,560,152

SWING CLAMP

Douglas P. Miller, Crystal Lake, Ill., assignor to Applied Power Inc., Brookfield, Wis.

Filed Apr. 27, 1984, Ser. No. 604,823
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—24 **10 Claims**

1. A powered work clamping device, comprising:

a housing having a chamber therein;

a plunger extending from said housing including a work engaging member at one end and a piston at its other end disposed within said chamber, said plunger mounted for rotative movement about its longitudinal axis between first and second positions, and for axial movement between extended and retracted positions;

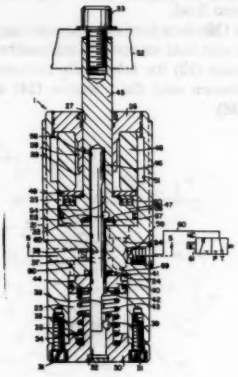
means for rotating said plunger between said first and second positions;

first biasing means for biasing said plunger toward its retracted position;

second biasing means for biasing said plunger toward its first rotative position;

a fluid inlet passageway communicating with said chamber and said rotation means; and

valve means in said passageway for sequentially directing pressurized fluid through said passageway first to said chamber to extend said plunger against said first biasing means and then to said rotation means to rotate said plunger against said second biasing means from its first position to its second position, and in the absence of pressurized fluid to permit return flow through said passageway first from said rotation means so that said plunger is rotated back to its first position



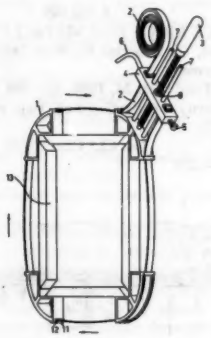
by said second biasing means and then from said chamber to retract said plunger.

4,560,153

FIXING TOOL FOR SQUARE FRAME

David C. Han, Fl. 7, No. 325, Fu-Hsing North Rd., Taipei, Taiwan

Filed Apr. 20, 1984, Ser. No. 602,467
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—42 **1 Claim**



1. A fixing tool for a square frame comprising:

three molds, each having an inner perimeter in the form of a right angle, an outer periphery in the form of an arc, and provided at each end with a slotted flange;

a base mold, having an inner perimeter adapted to cooperate with the inner perimeters of said molds to enclose a square, said base mold having an outer periphery in the form of an arc with a plane zone provided on a central part thereof;

two parallel guide rods, each connected normal to said plane zone of said base mold;

a fixing piece, slidably guided by said two guide rods so that said fixing piece can make contact with the plane zone of said base frame;

a rope, a first end of which is secured to one end of said fixing piece and a second end of which is passed through another end of said fixing piece; and

a screw handle, threadedly engaged with said fixing piece and having one end supported against said base mold.

4,560,154

PAPER SHEET FEED-OUT DEVICE FOR A PAPER SHEET COUNTING APPARATUS

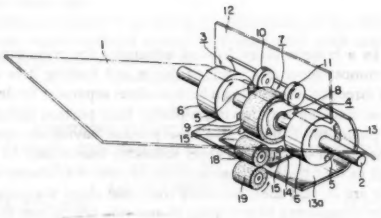
Hiroyoshi Nogi, and Hiroyuki Ookawa, both of Tokyo, Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,700

Claims priority, application Japan, Dec. 28, 1982, 57-195909; Jan. 31, 1983, 58-11078

Int. Cl.⁴ B65H *3/06, 5/06*

U.S. Cl. 271—10 **6 Claims**



1. An apparatus for counting the number of paper sheets in which the sheets stored in a hopper are fed out by a feed-out device and the paper sheets thus fed out are extracted by extracting rolls at a speed faster than the feedout speed, said feed-out device comprising

a driving shaft provided adjacent to a paper sheet outlet in the hopper;

a pair of axially spaced apart, first feed-out rolls mounted on said driving shaft, each roll having a peripheral surface portion, less in extent than the periphery of the roll, which provides a first frictional surface and the remaining portion of the peripheral surface providing a slippery surface which is less frictional than said first frictional surface, said peripheral surface portion of one said roll being aligned in the axial direction of said shaft with the peripheral surface portion of the other said roll;

a second feed-out roll mounted on said driving shaft intermediate said first feed-out rolls and having a second frictional surface extending for the full extent of the periphery of said second feed-out roll, said second frictional surface being of a material presenting a frictional force substantially equal to that of said first frictional surface; and

interconnecting means acting intermediate said driving shaft and at least said second feed-out roll for rotating at least said second feed-out roll by said driving shaft, said interconnecting means causing said second feed-out roll to be rotated in the same direction as said first feed-out rolls but permitting said second feed-out roll to be rotatable in said direction at a speed faster than said first feed-out rolls whereby said second feed-out roll may rotate freely in the paper sheet feed-out direction.

4,560,155

SHEET FEEDING APPARATUS WITH SHEET SEPARATOR

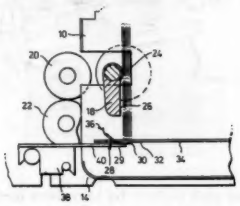
Steven M. Hosking, Hants, and Christopher J. Dixon, Rowlands Castle, both of England, assignors to De La Rue Systems Limited, Portsmouth, England

Filed Dec. 2, 1983, Ser. No. 557,546

Claims priority, application United Kingdom, Dec. 2, 1982, 8234422

Int. Cl.⁴ B65H *3/56, 3/08, 5/06*

U.S. Cl. 271—11 **4 Claims**



1. Sheet feeding apparatus comprising:

a housing;

a cassette for a stack of sheets, movable into and out of the housing to and from a sheet feeding position;

a sheet feeder mounted in the housing and including means for lifting sheets one by one from the stack in the cassette and to advance each sheet in turn away from the stack;

the cassette including an adjustable separator the tip of which, when the cassette is in the sheet-feeding position, extends into the path of an edge of a sheet as the sheet is lifted away from the stack;

and control means comprising a plurality of interchangeable elements each mounted one at a time in the housing so as to project into the path which is taken by the separator when the cassette is moved into the housing to the sheet-feeding position, each element having a different projection position corresponding to one of at least two possible levels, each corresponding to a different feed rate of the sheet feeder, whereby when the cassette is moved into the housing the control means automatically displaces the separator tip to cause it to project, to a further or lesser extent depending upon the feed rate, into the path which will be followed by the said edge of a sheet lifted from the stack by said lifting means.

4,560,156

DEVICE FOR DROP-FEEDING SHEET MATERIAL INTO A PRINTING APPARATUS OR THE LIKE

R. Clark DuBois, 332 Wakeman Rd., Fairfield, Conn. 06430

Filed Dec. 7, 1983, Ser. No. 558,945

Int. Cl.⁴ B65H *9/06, 3/00*

U.S. Cl. 271—18 **6 Claims**

2. A drop sheet feeder for moving sheets of sheet material from a storage location therein and along a sheet feed path to an associated printer or the like comprising:

a frame adapted to be mounted on a printer or the like,

sheet feed means supported in said frame for advancing associated sheets of sheet material introduced thereinto along a sheet feed path registering at its end with a sheet feed path of the associated printer,

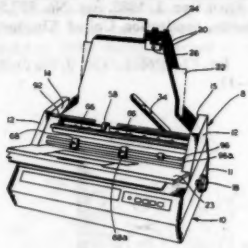
a plurality of trays adapted to receive at least one sheet of sheet material therebetween,

means supporting said plurality of trays in a generally upstanding position within said frame above said sheet feed means for reciprocal movement between a sheet retaining position and a sheet release position,

means for shifting selected trays from said sheet retaining position to said sheet release position, said shifting means

effecting sequential shifting of said trays for introducing the associated sheets of sheet material in a storage location between said selected trays into said feed path defined by said sheet feed means,

means movably mounted on said frame for movement into said feed path defined by said sheet feed means to block



said feed path defined by said sheet feed means and position the leading edges of the associated sheets of sheet material following their release from said plurality of trays, and

each of said plurality of trays having a magnetic holder at the upper end portion thereof for retaining the upper ends of said plurality of trays in close proximity to each other.

4,560,157

TRANSPORT DEVICE FOR INDIVIDUAL SHEETS TO BE COMBINED INTO A STACK

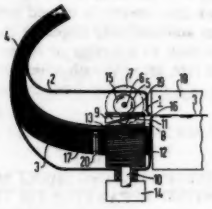
Jakub Hirschberg, Täby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 345,341, Feb. 3, 1982, abandoned. This application Oct. 9, 1984, Ser. No. 658,460

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104664

Int. Cl.[4] B65H *1/14, 29/42*

U.S. Cl. 271—126 **17 Claims**



1. Apparatus for the movement of individual sheets of x-ray film in a transfer direction relative to a vertical stack of said sheets disposed in a housing comprising a drive roller means mounted for driven rotation about a lateral axis within a first plane overlying said stack, a runner roller freely rotatable on lateral axle means connected to a rotary member mounted for rotation about a vertical axis such that said runner roller is movable through a second plane parallel to and beneath said first plane for intermittently bringing said runner roller into nip relationship with said drive roller means, said vertical axis perpendicularly intersecting said lateral axis, means for feeding one said individual sheet into engagement with said rotating drive roller means, and drive means for turning said rotary member to position said runner roller in nip relation with said drive roller means, while said drive roller means is rotating, for pressing said individual sheet against said drive roller means in said nip and permitting transfer of said individual sheet relative to said stack due to rotation of said drive roller means, said rotary member always being rotated relative to the transfer direction of said sheets such that said runner roller moves into nip relationship with said drive roller means in the transfer direction of said sheets.

4,560,158

BOTTOM SHEET SEPARATOR-FEEDER

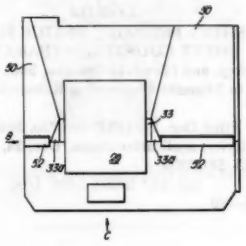
Lionel A. Wilson, Hitchin, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 20, 1983, Ser. No. 534,013

Claims priority, application United Kingdom, Sep. 21, 1982, 8226848

Int. Cl.[4] B65H *1/06, 3/12*

U.S. Cl. 271—165 **5 Claims**



1. In a bottom sheet feeding apparatus for separating the bottommost sheet in a stack of sheets and feeding it in a forward direction comprising a bottom sheet separator feeder and a sheet stacking tray having a planar base portion defining a base plane, the front of said base portion having an opening within which said bottom sheet separator feeder may be positioned to feed the bottommost sheet of a stack of sheets when sheets are in said sheet stacking tray, said sheet stacking tray further comprising two sloping planar side wings, one at each side of said opening in said base portion, said sloping planar side wings being angled upward from the base plane and being angled outward from front to rear of said tray, and each sloping planar side wing intersecting said base plane along a line from a point of the rear of the base in the approximate location of the rear corners of a rectangle the size of a sheet to be fed to a point at the front of the tray approximately midway between the front corners of a sheet to be fed and the centerline of a sheet to be fed, the improvement comprising:

raising means positioned on each of said sloping side wings for lifting the lead edges of downcurled sheets above said planar base portion of said stacking tray and thereby enhancing the feeding of the downcurled sheets.

4,560,159

APPARATUS FOR DETECTING MULTIPLE OCCUPIED POSITIONS IN A CONTINUOUSLY CONVEYED STREAM OF PRINTED PRODUCTS AT UNIFORM SPACING AND METHOD OF USE OF THE APPARATUS

Samuel Staub, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jun. 8, 1984, Ser. No. 618,670

Claims priority, application Switzerland, Jun. 14, 1983, 3260/83

Int. Cl.[4] B65H *7/12*

U.S. Cl. 271—263 **13 Claims**

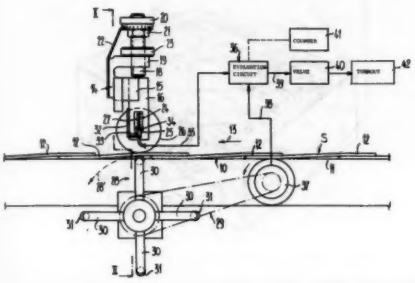
1. An apparatus for detecting multiple occupied positions in a continuously conveyed stream of sequential printed products arranged at a substantially uniform spacing from one another, comprising:

a deflectable sensor element oriented substantially toward a first side of the stream of printed products;

a counter-element oriented substantially toward a second

opposite side of the stream of printed products and arranged in essentially opposing relationship to said sensor element;

means for advancing said counter-element towards the second opposite side of the stream of printed products at a frequency corresponding to a predetermined frequency of passage of the stream of printed products;



the deflectable sensor element being arranged in an undeflected state thereof at a distance from the counter-element in an advanced state thereof corresponding essentially to an integer multiple of the thickness of a printed product; and

a signal generator responding to deflections of the deflectable sensor element operatively associated with said deflectable sensor element.

4,560,160

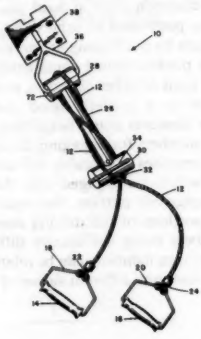
EXERCISE DEVICE FOR SWIMMERS

Brian C. Smith, 2306 Sockwell Dr., Huntsville, Ala. 35803

Filed Jun. 18, 1984, Ser. No. 621,447

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—133 **15 Claims**



1. A friction resistance exercise device for swimmers comprising:

a main body comprising:

an elongated body member,

a first cylindrical crosspiece fixedly attached to one end of said body member, and

a second cylindrical crosspiece rotatably attached to the opposite end of said body member;

a square-shaped ring attached to said second crosspiece at two points on opposite sides of said second crosspiece;

a Y-shaped bracket hanger rotatably attached to the ends of said first cylindrical crosspiece; and

a rope having its central portions looped over said first crosspiece, and having rope portions adjacent to said central portion being twisted about said elongated body member, one end of said rope being threaded through one side of said square-shaped ring and the other end of said rope being threaded through the opposite side of said square-shaped ring.

4,560,161

IMAGE DISPLAYING METHOD IN A CARD GAME MACHINE

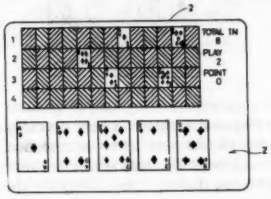
Junichi Hamano, Nishinomiya, Japan, assignor to Takasago Electric Industry Co., Ltd., Osaka, Japan

Filed Apr. 12, 1984, Ser. No. 599,847

Claims priority, application Japan, Jul. 19, 1983, 58-132287

Int. Cl.[4] A63F *1/00*

U.S. Cl. 273—85 CP **12 Claims**



1. An image displaying method for a card game machine comprising displaying all 52 cards of a deck in aligned array face down on a display screen in a first display area, displaying selected cards face up in said aligned array in response to selective input by a card player, displaying said selected cards face up in a second display area, removing the display of an undesired card from said second display area in response to a selective input by the card player, displaying another selected card face up from said aligned array of face down cards on said first display area in response to a selected input by the card player, displaying the last said selected card face up on said second display area, and simultaneously with said last step, continuing to display in said first display area the first said selected cards and simultaneously therewith displaying in said first display area said other selected card, whereby a player can thereby select desired cards from the aligned array of face down cards and replace unwanted cards with a second selection of desired cards from said aligned array of face down cards to thereby simulate card playing.

4,560,162

ADJUSTABLE GRIP FOR BOWLING BALL

Peter J. Miller, 24 Tristan Cir., Sacramento, Calif. 95823

Filed Dec. 20, 1984, Ser. No. 684,108

Int. Cl.[4] A63B *37/00*

U.S. Cl. 273—63 B **6 Claims**

1. An adjustable diameter finger receiving device for insertion into a bowling bowl finger opening which comprises:

a cylindrical member having both and inner and outer diameters, the outer diameter of said cylinder being sized such a that the cylindrical member will fit snugly into a finger hole of the bowling ball;

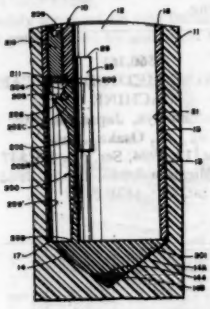
the cylinder having a top and bottom wall, and an eccentrically disposed vertical finger opening there through,

said cylindrical member being closed off at its bottom end by a base comprising a downwardly decreasing truncated cone,

an arcuate recess extending upwardly from the bottom of the cylinder and inwardly from the proximal side of said finger opening, terminating at a point below the top of said cylindrical member,

a bore extending downwardly from the top of said cylinder adjacent said vertical finger opening, and extending downwardly past at least a part of said recess, and communicating with said recess;

a bottom mounted flexible vertical arcuate section affixed to the upper surface of said base and sized to fit within said recess,

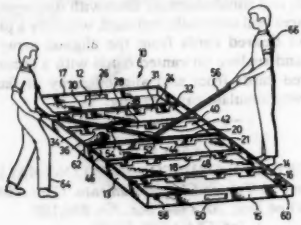


means disposed within said bore operably adapted to move the top of said vertical arcuate section inwardly from a first position within said recess to a second position out of said recess, thereby constricting the diameter of said finger opening.

4,560,163
HOCKEY GAME

Gordon Erickson, P.O. Box 1096, Salmon Arm, British Columbia, Canada

Filed Mar. 15, 1985, Ser. No. 712,200
Int. Cl.[4] A63B *67/04*; A63F *7/06*
U.S. Cl. 273—85 R **7 Claims**

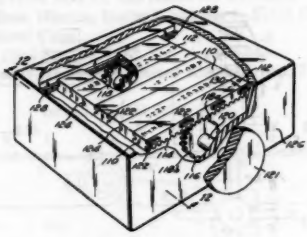


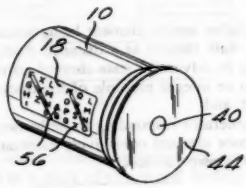
1. A hockey game for use with a ball or disk, comprising:
(a) a planar deck
(b) a pair of perimeter side walls along respective opposed long side edges of said deck;
(c) a pair of perimeter end walls along respective opposed short end edges of said deck, each end wall having a goal opening therein extending down to said deck;
(d) a plurality of substantially parallel spaced apart blocking walls extending across said deck from one perimeter side wall to the other, each blocking wall having openings therein extending down to said deck and sufficiently high and wide to permit passage therethrough of said ball or disk, and selected openings aligned along substantially parallel lines of sight from one perimeter end wall to the other with the width of said openings in said blocking walls gradually decreasing from the center of said deck towards either perimeter end wall.

4,560,164
TOY PUZZLE

Phillip H. Darling, 8866 Tulare Dr. 301H, Huntington Beach, Calif. 92646

Filed Jun. 13, 1984, Ser. No. 620,137
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—155 **17 Claims**





1. A manually manipulated mechanical device comprising:
a plurality of mutually positionable elements supported so that the elements are movable;
a drive selectably engaging and positioning different subsets of elements, at least one subset including at least one element in common with at least one other subset, the subsets being positioned to achieve an operative location of the elements by positioning an incremental part of each element in a predetermined combination with the similar incremental parts of other elements, so that the incremental parts are in a predetermined mutual relationship, wherein the elements comprise: driven members having engageable members for engaging the drive; and wherein the drive comprises a plurality of driving members, a plurality of which are engaged with the driven members along an engageable portion, the relative extents of the engageable portions of the driving members and on the driven members being sufficiently different so that the driving and driven members can be relatively repositioned to engage at least one different subset of said driven members.

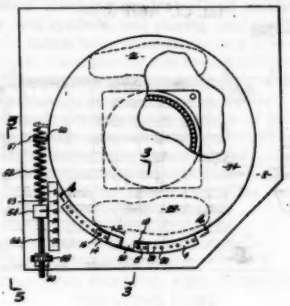
4,560,165
GOLF PRACTICE DEVICE

Frank Witteman, 372 Franklin Ave., Redlands, Calif. 92373; Richard T. Witteman, P.O. Box 1164, Santa Fe, N. Mex. 87501, and Donald F. Witteman, 5089 Fallhaven La., La Canada, Calif. 91011

Filed May 27, 1983, Ser. No. 498,926
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 A **11 Claims**

2. A golf pratice device for a golfer, comprising: a base; a platform for the golfer to stand on; a rotatable mounting connected to the base and the platform, said mounting allowing the platform to rotate clockwise and counterclockwise in a horizontal plane, said base remaining stationary during such rotation; a tensioning means connected to the platform for

providing resistance to the rotation of the platform in one direction; and a movement stop connected to the base, said movement stop preventing rotation of the platform beyond a predetermined small angle of rotation achieved during a golfing swing for minimizing rotation of the golfer, the small angle of rotation being measured from a resting position of the platform to a stopped position of the platform caused by said movement



4,560,166

GOLFER'S HEAD MOVEMENT INDICATING DEVICE

Edwin E. Emerson, 106 Pike St., East, Osakis, Minn. 56360

Filed Nov. 27, 1984, Ser. No. 675,415

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—183 B **1 Claim**

1. A golf training device, comprising, in combination, a cap for being worn on a golf player's head, and an electric warning circuit installed on said cap, for indicating if said player's head was moved before or after a golf club has struck a golf ball; said warning circuit comprising an audible sound system that includes a unit mounted on a top of said cap and a unit mounted on a tip of a visor of said cap, said unit on said cap top including a battery, a buzzer, an on-off switch and an inhibitor switch in a single series circuit, said unit on said visor tip comprising a momentum switch in said series circuit and also including a microphone in a secondary circuit with said inhibitor switch, said microphone having a plurality of concentric baffles forming a grill in front thereof.

4,560,167

DEVICE FOR TRAINING TO PLAY GOLF

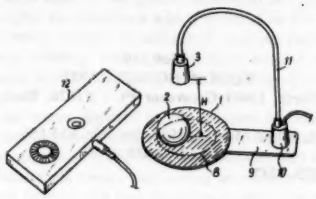
Alain P. Perreau, Compiegne, and Jean-Louis Perreau, Rocquencourt, both of France, assignors to Sidinter S.A., Compiegne, France

Filed Feb. 10, 1984, Ser. No. 579,076

Claims priority, application France, Feb. 11, 1983, 83 02211

Int. Cl.[4] A63B *69/36, 57/00*

U.S. Cl. 273—184 A **7 Claims**



1. A device for training to play golf, comprising a flat, thin disc of determined diameter substantially equal to that of a golf hole, in a color which creates a contrast with the color of the balls used, placed horizontally during use, a means for monitoring said disc mounted coaxially above said disc, at a predetermined distance therefrom, this monitoring means comprising an electronic component sensitive to the light reflected toward said sensitive component from said disc and connected to an electronic circuit adapted to analyze the variation of the reflected light received wherein said variation is to be caused by the passage of a rolling ball over said disk and to assess the probability of entrance of the ball into a fictitious hole represented by said disc relative to the passage of the ball relative to this fictitious hole said electronic circuit means comprises a circuit for detecting any rapid variation of the reflected light, a circuit for measuring the duration of this variation, a comparator circuit comparing this duration with a predetermined duration and at least one signal emitter, whereby a signal will be emitted corresponding to the passage of a ball relative to said disk and, when said duration is greater than said predetermined duration, indicating the entrance of the ball into said fictitious hole and when said duration is less than said predetermined duration, indicating the failure of the ball to enter the fictitious hole.

4,560,168

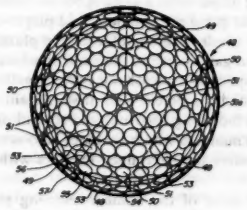
GOLF BALL

Steven Aoyama, Glendale Hts., Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.

Filed Apr. 27, 1984, Ser. No. 604,726

Int. Cl.[4] A63B *37/14*

U.S. Cl. 273—232 **29 Claims**



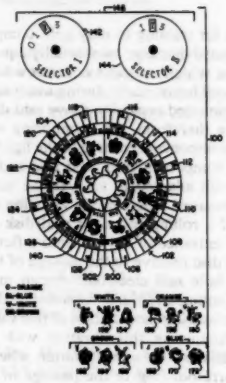
1. A golf ball having a spherical surface with a plurality of dimples formed therein and six great circle paths which do not intersect any dixples, the dimples being arranged by dividing the spherical surface into twenty spherical triangles corresponding to the faces of a regular icosahedron, each of the twenty triangles being subdivided into four smaller triangles

consisting of a central triangle and three apical triangles by connecting the midpoints of each of said twenty triangles along great circle paths, said dimples being arranged so that the dimples do not intersect the sides of any of the central triangles.

4,560,169
ZODIAC BOARD GAME

Thomas North, 10401 Grosvenor Pl. - #1626, Rockville, Md. 20850

Filed May 23, 1984, Ser. No. 613,150
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—242 **12 Claims**



1. A board game, comprising:

a board having a closed path of game spaces thereon, the path having a starting point and a finishing point being divided into multiplicity sectors, each sector comprising a plurality of game spaces and each sector corresponding to one of a plurality of indicia where the number of sectors is divisable by the number of indicia into an integer number,

a plurality of game pieces for movement from one game space to another along the closed path, each of said game pieces bearing markings corresponding to one of said indicia,

player-operated means for secretly selecting one of a first plurality of numbers when the game piece of the number-selecting player is on a game space in a sector corresponding to said game piece indicia, said player-operated means further for selecting one of a second plurality of numbers when said game piece of the number-selecting player is on a game space in a sector not corresponding to said game piece indicia, wherein said first plurality consists of n numbers including zero and said second plurality consists of (n−m) numbers which excludes zero where n and m are each positive predetermined integers with n greater than m,

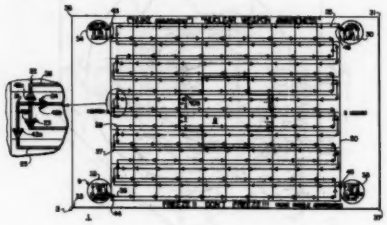
said game piece of the number-selecting player being advanced along the closed path by a number of spaces equal to either (a) the non-zero number selected or (b) a responsive number given in response to the number selected when zero was selected where said responsive number is not identical to said selected number, and

a second game piece is advanced along the closed path by a number of spaces equal to the selected number where said responsive number is identical to said selected number.

4,560,170
NUKE AWARENESS GAME

Donatus O. Enyi, 2100 19th St., NW., Apartment #701, Washington, D.C. 20009

Filed Jun. 20, 1984, Ser. No. 622,628
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—248 **18 Claims**



1. A nuclear awareness game comprising:

a. a game board having imprinted thereon a plurality of squares,

b. distinctively color coded play paths formed across the plurality of squares arranged in at least two oppositely directed serpentine lines having a generally rectilinear switched-back arrangement intersecting every square on the board,

c. distinctively color coded playing pieces that are moveable along a playing path according to a sequence that is distinctively matched with the color coding of respective playing paths;

d. squares forming a first portion of the board including distinctive first indicia for the players and playing pieces, forming a first rewardpenalty-option zone;

e. a second portion of the board, including spaces having distinctive second indicia different from the first indicia, forming beginning and ending zones for the players and playing pieces at the opposite ends of each of the playing paths; and cards with indicia relating the play and being a clock correlation means for governing the movement of the pieces by the players.

4,560,171
POKER GAME

Zacharias Anthony, 181 Atlantic Ave., Long Branch, N.J. 07740

Filed Jul. 30, 1984, Ser. No. 635,703
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—269 **25 Claims**

1. A poker game comprising:

a plurality of gameboards, each of said gameboards including at least 52 locations, each of said locations displaying therein a symbol of a different playing card from a standard deck of cards, each of said locations further displaying therein one of a series of at least 52 sequential indicia, said indicia being independent of and unrelated to said playing card symbols, said playing card symbols or said sequential indicia being randomly arranged on each gameboard, each of said gameboards having different combinations of playing card symbols and indicia within its locations; and

means for randomly generating a series of indicia corresponding to said sequential indicia, whereby upon operation of the said generating means, each of said gameboards has associated therewith a poker hand consisting of the playing cards symbolized in the locations corresponding to the series of indicia thus generated.

4,560,172
NON-CONTACTING SEALING ARRANGEMENT FOR A ROTATING PART

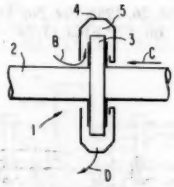
Horst Zimmermann, Munich, and Joachim Lorenz, Dachau, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,248

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311121

Int. Cl.[4] F16J *15/42*

U.S. Cl. 277—3 **20 Claims**



1. A non-contacting sealing arrangement between a rotating part and a stationary part, comprising centrifugal disk means arranged on the rotating part, a fluid sealing medium being present between the centrifugal disk means and the stationary part, the stationary part having in the axial direction of the rotating part an atmosphere side and a sealing medium side, the stationary part being constructed as spiral housing means having a circumferential hollow space surrounding the rotating part contact-free, the hollow space becoming wider in the direction of rotation of the rotating part and being connected within the area substantially of its largest dimension to a sealing medium return line.

4,560,173
MECHANICAL SEAL ASSEMBLY WITH COOLANT CIRCULATION STRUCTURE

William V. Adams, Scotts, and Duane A. Avard, Schoolcraft, both of Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 616,457, Jun. 1, 1984, abandoned. This application Dec. 21, 1984, Ser. No. 684,874

Int. Cl.[4] F16J *15/34, 15/40*

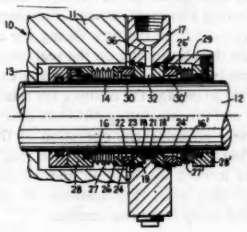
U.S. Cl. 277—15 **20 Claims**

1. A mechanical seal construction for sealing a shaft means which projects from and is rotatable with respect to a surrounding housing, comprising in combination:

annular seal stator means disposed in surrounding relationship to said shaft means and nonrotatably coupled with respect to said housing, said stator means including an annular gland member nonrotatably coupled to said housing and positioned in substantially concentric and surrounding relationship to said shaft means, said gland member having opening means extending therethrough for accommodating said shaft means, and first and second insert rings disposed within said opening means and sealingly and stationarily mounted on said gland member so as to substantially concentrically surround said shaft means, said first and second insert rings being disposed in axially spaced relationship adjacent the opposite axial sides of said gland member so as to define an annular region therebetween which is closed on the radially outer periphery thereof by said gland member, each of said insert rings defining thereon a stationary annular seal face which faces axially outwardly from one side of the gland member;

first seal rotor means disposed axially adjacent one side of said stator means in surrounding relationship to said shaft means, said first seal rotor means being nonrotatably and sealingly fixed to said shaft means and having an annular axially directed seal face on one end thereof maintained in rotatable and slidable engagement with the seal face on said first insert ring;

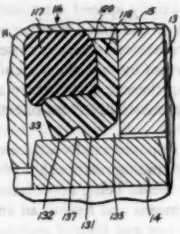
second seal rotor means disposed axially adjacent the other side of said stator means in surrounding relationship to said shaft means, said second rotor means being sealingly and nonrotatably fixed to said shaft means and defining thereon an annular axially directed seal face which is maintained in rotatable and slidable engagement with the seal face on said second insert ring; and



cooling means defining a closed system for effecting recirculation of coolant through a determined arcuate extent of said annular region, said cooling means including first and second openings extending through said gland member and communicating with said annular region at circumferentially spaced locations, said first and second openings functioning as a coolant inlet and a coolant outlet respectively, said first and second openings each communicating with said annular region in substantially perpendicular relationship with respect to the rotational axis of said shaft means, and closed piping means disposed externally of said gland member and connected between said first and second openings for defining a closed system permitting coolant to be recirculated from said outlet back to said inlet;

said cooling means including obstruction means having a first portion fixed to said gland member and projecting into said annular region at a first location disposed directly adjacent the downstream side of said outlet for directing the coolant within said annular region to flow radially outwardly through said outlet, said obstruction means also including a second portion fixed to said gland member at a second location directly adjacent the upstream side of said inlet and projecting radially inwardly into said annular region for substantially obstructing the cross section thereof, the annular region as it extends angularly from the inlet in the direction of shaft rotation to the outlet being of substantial radial and axial cross-sectional dimensions and being free of obstructions for defining an arcuate passage which is part of said closed system and is of substantial arcuate extent.

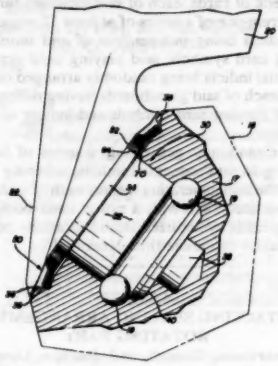
4,560,174
MULTI LIP SEAL
Ugo Bisi, Ferrara, Italy, assignor to Berco S.p.A., Italy
Filed Dec. 2, 1983, Ser. No. 557,210
Int. Cl.⁴ F16J *15/34*
U.S. Cl. 277—92 **13 Claims**



1. A seal means for a track joint said seal means being adapted to be positioned in a chamber between two coupled mechanical parts rotating about a pin, said parts being movable axially with respect to one another, the pin being connected to one part and rotating within a bushing connected to the other part with pin and bushing, characterized in that the seal means comprises an annular elastic O-ring, and an annular seal ring of "L"-shaped cross section, said seal ring made of relatively stiff material having a hardness on the order of Shore A 93 to 97, said seal ring having a top section with a retainer projection at the extremity remote from the base facing the elastic ring for helping to retain the elastic ring on the seal ring, and having a base with at least two annular seal projections extending therefrom and adapted to engage the bushing for retaining lubricant in the chamber and for preventing dirt from entering the chamber and adversely affecting the operation of the seal means, said elastic O-ring being coupled to said seal ring for urging the seal projections toward the bushing and for maintaining the seal notwithstanding axial displacement of the mechanical parts toward and away from one another.

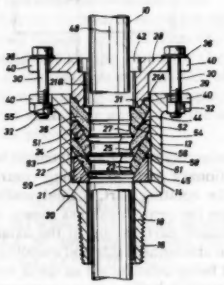
4,560,175
HERMETICALLY WELDED BELLEVILLE SEAL FOR ROCKS BITS
Nareshchandra J. Kar, Westminster, and Cary A. Roth, Huntington Beach, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Jul. 5, 1984, Ser. No. 628,068
Int. Cl.⁴ F16J *15/34*; F16C *19/49*
U.S. Cl. 277—92 **12 Claims**

1. A sealed bearing rotary cone rock bit comprising:
a rock bit body forming a first pin end and a second cutting end, at least one rotatable cone is secured to a journal bearing cantilevered from a portion of said bit body near said second cutting end of said body, and
a belleville seal disposed between said at least one rotatable cone and said journal, said seal having a first annular dynamic seal face and a second annular static portion, said second annular static seal portion being metal, said static metal portion is metallurgically bonded to its static counterpart through 360° of its circumference at an interface formed between said second static seal portion and said counterpart with a high-energy welding system having a power level in a focused region at said interface of at least



1000 watts, said metallurgical bond thereby hermetically seals said metal static portion to said counterpart.

4,560,176
INVERTED CONE STUFFING BOX
H. Milton Hoff, Borger, Tex., assignor to J. M. Huber Corporation, Locust, N.J.
Filed Jul. 26, 1983, Ser. No. 517,484
Int. Cl.⁴ F16J *15/24*
U.S. Cl. 277—105 **29 Claims**



1. For use in a petroleum well having a reciprocating polished rod with a central axis therethrough, a stuffing box disposable about said rod and in coaxial alignment therewith, said box comprising:
a body having
a cylindrical inner wall;
a shoulder perpendicular to said wall;
said wall and said shoulder defining a cavity in said body; and
a threaded neck having an internal bore therethrough in fluid communication with said cavity;
a gland seat disposed within said cavity and carried by said shoulder having
an internal surface formed by a bore passing through said seat and defining a conical frustum having
a base and an apex lying, respectively, above and below a plane perpendicular to said axis and intersecting said seat;
a lower, a middle, and an upper inverted cone packing bland each disposed within said cavity and having

an outer surface including a shoulder for sealingly engaging said inner wall of said body; and

an inner surface formed by a bore passing through said gland and including a ridge for sealingly engaging said rod;

a portion of said outer and inner surfaces of said lower gland being in mating engagement with a portion of said internal surface of said seat, and said outer surface of said middle gland, respectively; and

a portion of said inner surface of said middle gland matingly engaging said outer surface of said upper gland;

a portion of said upper gland further including an upper gland surface having a portion defining at least one ring-shaped surface lying in at least one plane perpendicular to said axis;

a gland cap having

an oil reservoir formed by a bore passing through said gland cap; and

a gland follower member disposed within said cavity and matingly engaging said ring-shaped surface of said upper gland surface; and

a plurality of fasteners interconnecting said gland cap and said body; and

said bores of said neck, gland seat, lower, middle, and upper glands, and gland cap being in coaxial alignment with said central axis and adapted to receive said rod.

4,560,177

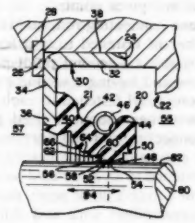
CONTOURED SHAFT SEAL FOR HIGH PRESSURE APPLICATIONS

William M. Riley, Jr., Gurnee, Ill., assignor to Chicago Rawhide Mfg. Co., Elgin, Ill.

Filed Aug. 9, 1984, Ser. No. 639,120

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—134 **11 Claims**



1. A fluid seal unit for high pressure sealing applications, said seal unit comprising, in combination, an annular seal casing made from a relatively rigid material and adapted to be received in use within one element of a machine mechanism to be sealed, and an annular elastomeric sealing lip body having a portion thereof bonded to one margin of said annular casing, said lip body being defined at least in part by air and oil side frustoconical surfaces meeting each other along a substantially circular locus to form a primary seal band along which said sealing lip body, in use, will contact one other element of said machine mechanism in snug fluid-tight sealing engagement in the relaxed condition of said lip body when the fluid in the region of said machine mechanism is under a first pressure, said frustoconical air side surface of said lip body further including a plurality of auxiliary sealing ribs spaced axially apart from each other by fluid-retaining grooves, each of said auxiliary ribs having an area adapted to contact said other element and being sized so as to have progressively greater spacing from said other element in the direction away from said primary seal band, said seal body air side frustoconical surface being constructed and arranged such that, at said first pressure, the edges of said auxiliary ribs are spaced from said other element, and such that, as the pressure in said region increases, said seal body will be deflected radially such that the edges of additional ribs will contact said other element to provide increased seal band contact area and to entrap sealed fluid in said grooves lying between adjacent auxiliary ribs.

4,560,178

SEALING SLEEVE WITH A CONNECTING SLEEVE FOR THE LIQUID AND/OR GASTIGHT MOUNTING ON A CONNECTING STUB

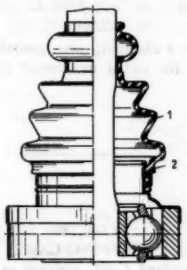
Jürgen Hempel, Beethovenstrasse 6, 6940 Weinheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 537,046, Sep. 29, 1983. This application Feb. 13, 1984, Ser. No. 579,819

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309386

Int. Cl.⁴ F16J *15/52*; F16D *3/84*

U.S. Cl. 277—212 FB **9 Claims**



1. A sealing sleeve/connecting stub combination, said sealing sleeve being of a polymeric material of low elasticity and having at least one connecting sleeve for the liquid and/or gastight connection of said sealing sleeve to said connecting stub, said connecting stub having an outer limiting surface,

wherein the connecting sleeve has an inner circumference which is larger than the outer circumference of the connecting stub,

wherein the connecting sleeve has a folding extending substantially non-parallel to the circumferential direction, and

wherein said folding is compressible so as to form at least one continuous sealing surface corresponding to the outer limiting surface of the connecting stub.

4,560,179

CHUCK

Josef Steinberger, Düsseldorf, and Wilhelm Müller, Hilden, both of Fed. Rep. of Germany, assignors to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 423,891

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1981, 8130683[U]

Int. Cl.⁴ B23B *31/16*

U.S. Cl. 279—15 **2 Claims**

1. In a chuck having a T-slot which receives a slot block, the latter being adapted for fastening of a part on a member by at least one attachment screw which engages into the slot block, the member having a face surface and an outer periphery and having said T-slot therein, the improvement wherein

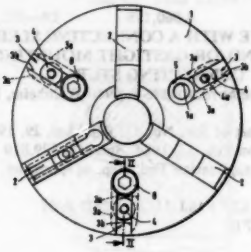
said T-slot has a radially inward end and a radially outward end with respect to said outer periphery of said member, and a base with respect to the face surface of the member,

said slot opens at said radially inward end into a continuous bore extending from the face surface of the member, said bore having a diameter substantially equal to the width of said slot at said base of said slot,

at least said base of the slot at the radially outward end of the

slot terminates at a radial distance from said outer periphery,

the chuck has a chuck body, and



said member is a clamping jaw, guidably mounted in the chuck body for radial movement with respect to the chuck body.

4,560,180

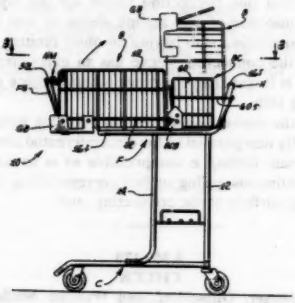
SHOPPING CART

Harrold Ulmer, Sunland, Calif., assignor to Whittar Industries, Ltd., Los Angeles, Calif.

Filed Jun. 11, 1984, Ser. No. 619,575

Int. Cl.⁴ B62B *3/08*

U.S. Cl. 280—33.99 B **22 Claims**



1. A shopping cart comprising a wheeled chassis, an elevated frame carried by the chassis, an upwardly opening basket including spaced side walls upstanding from a bottom wall, the bottom wall being carried by said elevated frame, the basket having a gate at the front end thereof and open at the rear end thereof, a baby seat compartment secured to the rear portion of said elevated frame immediately behind the open rear end of said basket, said baby seat compartment including spaced side walls upstanding from a bottom wall, a baby seat gate arranged adjacent the front of the baby seat compartment between the spaced side walls of the baby seat compartment, and means for pivotally securing said baby seat gate to the baby seat compartment to permit said gate to be secured thereto in an upright position and secured against movement in either the forward or rearward direction, said means permitting release of the baby seat gate from its upright position to permit said gate to be swung down to rest on the bottom wall of said baby seat compartment or the bottom wall of said basket.

4,560,181

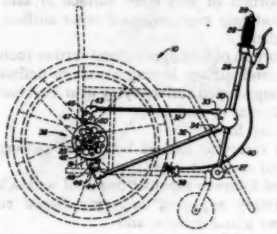
WHEELCHAIR OPERATED BY HAND PEDALLED RECIPROCATING MOTION

Matthew A. Herron, Palo Alto, Calif., assignor to Design Loft, Inc., Palo Alto, Calif.

Filed Jan. 30, 1984, Ser. No. 576,068

Int. Cl.⁴ B62M *1/14*

U.S. Cl. 280—242 WC **19 Claims**



1. A wheel chair, comprising,

a chair frame;

at least one lesser diameter wheel mounted to said frame at a front base portion thereof;

two larger diameter drive wheels mounted to said frame at a rear base portion thereof; and

at least one drive mechanism fastened to one of said drive wheels for direct transfer of drive energy thereto, said drive mechanism including;

(a) a lever arm having a first end portion thereof fastened to said frame for reciprocal pivotal movement about a first pivot point at a front base portion thereof, and having a second end portion including a hand grip to allow operator effected reciprocal pivotal movement about said first pivot point;

(b) at least one connecting rod, said rod having a first end portion thereof fastened to said lever arm for pivotal movement about a second pivot point at a lever arm midportion, and having a second end portion;

(c) at least one pawl fastened to each connecting rod for pivotal movement about a third pivot point at said second connecting rod end portion;

(d) at least one radial crank having a first end portion thereof fastened to an associated pawl for pivotal movement about a fourth pivot point, said fourth pivot point being noncoincident with said third pivot point, and having a second end portion thereof fastened for pivotal movement about a central pivot point coaxial with a drive wheel axle; and

(e) a ratchet wheel having a center portion fastened for rotational movement about said central pivot point, and having a plurality of circumferential teeth for engagement with said pawl;

whereby lever arm operation in one direction engages said pawl with said ratchet wheel teeth for translation of reciprocal lever arm movement to rotational ratchet wheel movement in a drive direction.

4,560,182

BICYCLE

Kiyoshi Yamaguchi, 22-26, Showa-Cho, Atami-Shi, Japan

Filed Feb. 21, 1984, Ser. No. 581,604

Claims priority, application Japan, Feb. 23, 1983, 58-027657

Int. Cl.⁴ B62M *1/02*

U.S. Cl. 280—257 **4 Claims**

1. In a bicycle having a handle, a front wheel a rear wheel, a saddle and a frame, a torque generating mechanism for driving the rear wheel which comprises

a main shaft pivotally supported at the lower section of the frame;

an auxiliary shaft pivotally supported at the lower section of the frame, said auxiliary shaft being arranged in parallel rotation to said main shaft and at a predetermined distance from said main shaft;

a front chain wheel and first gear axially fixed to one end of said main shaft;

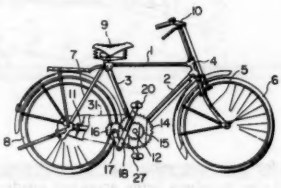
a second gear fixed to one end of said auxiliary shaft, said second gear being meshed with said first gear;

a first lever, one end of which is fixed to the end of said auxiliary shaft at one end thereof;

a first crank lever pivotally connected to the free end of said first lever, said first crank lever being provided with a guide slot substantially in the center thereof;

a first pedal pivotally connected to the free end of said first crank lever;

a protruding pin eccentrically fixed to said front chain



wheel, said protruding pin being engaged with said guide slot;

a rear chain wheel fixed to said rear wheel;

a drive chain extending between said front chain wheel and said rear chain wheel;

an auxiliary lever fixed to the other end of said main shaft;

a second lever fixed to the other end of said auxiliary shaft;

a second crank lever pivotally connected to said second lever at the end thereof, said second crank lever being formed with a guide slot;

a protruding pin fixed to the free end of said auxiliary lever, said protruding pin being engaged with said guide slot, and

a second pedal pivotally connected to the free end of said second crank lever, whereby torque for rotating the rear wheel can be increased by successively operating said pedals

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4,560,183

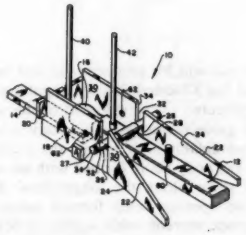
TRAILER HITCH GUIDE

Charles E. Cook, Rte. 4, Box 1482-C, Eufaula, Okla. 74432

Filed Dec. 9, 1983, Ser. No. 559,956

Int. Cl.[4] B60D *1/04*

U.S. Cl. 280—477 **16 Claims**



1. A trailer hitch guide for guiding the joining of a vehicle trailer hitch with a trailer tongue, said trailer hitch guide comprising:

a base connectable to said vehicle trailer hitch;

a first cam surface removably connectable to said base;

a second cam surface connectable to said trailer tongue, said first and second cam surfaces cooperating to cause relative vertical displacemcnt between the tongue and the vehicle trailer hitch as they approach in a horizontal plane, this vertical displacement operating to secure the trailer tongue to the vehicle trailer hitch;

a pair of lateral guides attachable to said base and converging across a substantial horizontal plane at the vehicle trailer hitch;

wherein said first cam surface is formed by the upper edges of said pair of lateral guides.

4,560,184

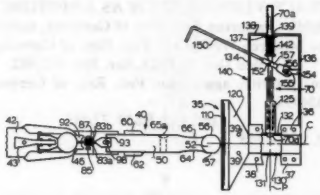
TRAILER HITCH

Thomas M. Williams, Jr., Rte. 8, Box 414, Durham, N.C. 27704

Filed Nov. 23, 1984, Ser. No. 674,524

Int. Cl.[4] B62D *1/16*

U.S. Cl. 280—478 B **9 Claims**



1. An automatic trailer hitch assembly for use with a towing vehicle and a towed trailer or other towed vehicle having a metal-formed housing with a ball socket at its towing end, comprising:

(a) a shank unit for the towed vehicle providing elongated shank structure including:

(i) at the trailing end a ball member adapted for being releasably coupled in the ball socket of said housing;

(ii) at the leading end surfaces facilitating the guidance of said leading end when in contact with guide surfaces;

(iii) means for releasably securing said elongated shank structure to said housing with said ball member coupled in said socket;

(iv) means for maintaining said elongated shank structure in some selected forwardly-directed position preparatory to being coupled to a receiving unit on said towing vehicle;

(v) a first passage therethrough for receiving a locking pin; and

(b) a receiving unit adapted for being secured to the rear of the said towing vehicle for being releasably secured to said shank unit including:

(i) entry structure providing tapered wall guide surfaces for receiving and guiding the leading end of said shank structure leading end as required to direct said leading end into coupling alignment when said leading end is moved into said entry structure;

(ii) tubular structure forming an integral forward continuation of said entry structure and providing a bore for receiving said shank structure leading end after being guided thereto on said wall guide surfaces, the internal shape and length of said bore being selected to permit some predetermined length of said shank structure to enter said bore;

(iii) a second passage through said tubular structure for receiving a locking pin therein and matable with said first passage when said predetermined length of said shank structure has been inserted in said bore; and

(iv) locking structure mounted on said receiving unit and including:

(aa) a locking pin movable between a first position in

which the leading end of said locking pin slightly protrudes into and permits free passage of said shank structure into said tubular structure and a second position in which said pin passes through both said passages to couple said shank and receiving units together;

(bb) lever means connected to said locking pin and movable with said pin between said first and second positions;

(cc) spring tensioning means arranged to be tensioned when said lever means moves said pin to said first position and to apply the force of such tensioning when said lever moves with said pin to said second position; and

(dd) frame structure mounting said locking pin, lever means and spring tensioning means enabling said lever means to be cocked into said first position and to be automatically released from said first position when the leading end of said locking pin protruding into said bore engages said leading end of said shank structure.

4,560,185

RIDER EJECTOR ARRANGEMENT FOR A SINGLE TRACK VEHICLE, SUCH AS A MOTORCYCLE

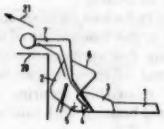
Josef Seidl, Germering, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,482

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244967

Int. Cl.⁴ B62J *27/00*

U.S. Cl. 280—748 **20 Claims**



1. A single track vehicle comprising a frame, a seat and a deflection surface means arranged generally in front of the upper body of the driver for accelerating the driver upwardly in case of a deceleration conditioned by an accident, characterized in that the deflection surface means is constructed as a form-rigid support element which is pivotal with respect to the frame about a cross axis located below and in front of the deflection surface means.

4,560,186

CONNECTING PIN CONFIGURATION

Masaaki Onitsuka, and Kazuyuki Fujiwara, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 1, 1983, Ser. No. 500,001

Claims priority, application Japan, Mar. 2, 1983, 58-028947[U]

Int. Cl.⁴ B60R *21/00*

U.S. Cl. 280—752 **11 Claims**

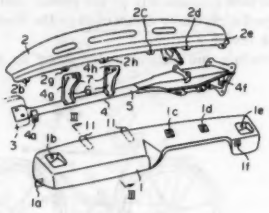
1. An instrument panel assembly of an automobile, comprising:

an instrument panel safety pad extending generally transversely in an automobile cabin and having a first surface exposed to the cabin space and a second surface opposite to said first surface, said safety pad having at least one pin projecting from said second surface, each said at least one pin comprising, in cross-section, vertical wing portions and horizontal wing portions;

a cowl panel extending generally parallel to said safety pad at a front side of said safety pad;

a transversing reinforcement on an automobile body including at least one stay to receive said cowl panel; and

at least one clip means inserted in an opening provided in said at least one stay to receive said at least one pin for securing said safety pad to the automobile body, each said at least one clip means having a wall defining an oblong



recess for inserting each said at least pin, two spaced parallel clip members being arranged inside of said wall, said vertical wing portions engaging with said clip members and having projections on their outer surfaces adjacent to the end thereof, the distance between the outer surfaces of said horizontal wing portion of said pin being smaller than that of the recess defining wall in the oblong direction so that said pin can move in the clip means in the clip member extending direction within the limit determined by the above dimensions after the pin is inserted in the clip means.

4,560,187

GUIDE RAIL FOR AUTOMATIC SEAT BELT

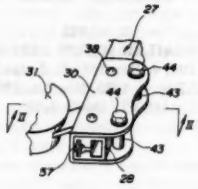
Noritada Yoshitsugu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 6, 1983, Ser. No. 558,587

Claims priority, application Japan, Feb. 22, 1983, 58-24601[U]

Int. Cl.⁴ B60R *21/00*

U.S. Cl. 280—804 **16 Claims**



1. A guide rail unit for an automatic seat belt comprising:

a guide rail body formed in a rectangular sectional shape;

a slider connected to the side end of the seat belt inserted into said guide rail body with a body, a head and a slider drive tape slidably inserted into the guide rail body;

said guide rail body being formed with an opening for guiding said slider along the longitudinal direction of said body, said opening being formed sequentially from the opening side thereof, with a guide groove for the slider drive tape, a guide groove for the slider body and a guide groove for the slider head;

a thin anchor bracket secured to said guide rail body around only the end of said guide rail body;

said anchor bracket being formed with an opening opposite

to the opening of said guide rail body for guiding the slider, and with a mounting hole at a position in the vicinity of said guide rail body;

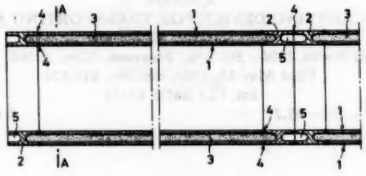
said guide rail body being mounted at the end thereof through the anchor bracket to a pillar.

4,560,188

THERMALLY INSULATED PIPE FOR THE CONSTRUCTION OF UNDERWATER PIPELINES

Alfredo Berti; Werther Mussati, both of Fano, and Roberto Bruschi, S.Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Apr. 15, 1983, Ser. No. 485,437
Claims priority, application Italy, Apr. 20, 1982, 20821 A/82
Int. Cl.⁴ F16L *59/14*
U.S. Cl. 285—47 **3 Claims**



1. A thermally insulated prefabricated pipe for the construction of underwater pipelines, comprising

an outer tube,

an inner tube concentric to and spaced from said outer tube thereby forming an annulus between said outer tube and said inner tube,

a cylindrical double Tee end section welded to said outer tube end and said inner tube end thereby sealing said annulus; and

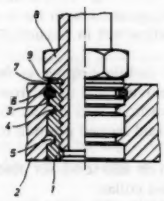
a thermally insulating material contained within said annulus.

4,560,189

SEALING CONNECTION

Werner Lang, Calw, and Jürgen Kretschmer, Weinstadt-Schnaidt, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,271
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246768
Int. Cl.⁴ F16L *5/02*
U.S. Cl. 285—158 **22 Claims**



1. A gas and fluid sealing connection comprising:

a metallic body having at least one groove formed in its outer surface,

an elastomeric sealing ring disposed in said groove and configured to seal the inside of the groove from the adjacent outer surface of the metallic body while accomodating compression of the sealing ring in the direction of the bottom of the groove, and

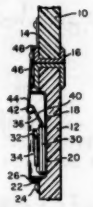
embedding plastic applied to the outer surface of the metallic body in the area of the groove to form a plastic body wall member with said metallic body embedded in the plastic and said sealing ring compressed by the plastic to form a gas and fluid seal between the plastic body wall member and the metallic body.

4,560,190

FASTENING ASSEMBLY

Ernest A. Werner, Bristol, Conn., assignor to J. H. Sessions & Son, Bristol, Conn.

Filed Feb. 25, 1983, Ser. No. 469,903
Int. Cl.⁴ E05C *5/02*
U.S. Cl. 292—111 **6 Claims**



1. In a fastening assembly for use in securing together first and second panels meeting at a joint wherein said first panel is provided with a strike fixedly attached thereto adjacent said joint and said second panel is provided with a catch unit fixedly attached thereto adjacent said joint; the improvement comprising an improved catch unit comprising:

(a) a base plate including a recessed portion recessed into said second panel and a rim surrounding said recessed portion mounted on the surface of said second panel,

(b) a slide member mounted within said recessed portion for sliding movement parallel to said base plate in a direction perpendicular to said joint, said slide member including a first end portion remote from said joint being substantially adjacent the surface of said recessed portion and a second end portion adjacent said joint bent at an angle from said first end portion and extending upwardly from said recessed portion toward said rim and terminating below said rim in a hinge means and said bent second end portion being of such dimension and flexibility as to function as a spring which deflects during locking and unlocking,

(c) an operating mechanism fixed on said base plate within said recess portion below said rim operatively connected to said slide member to provide said sliding movement,

(d) a catch member having one end hinged to said hinge means on said slide member, said catch member adapted to extend across said rim and said joint and engage said strike in the locked position and including spring means engaging said catch member and said slide member whereby said spring means rotates said catch member on said hinge means into said recessed portion substantially below said rim in the unlocked position.

4,560,191

DOOR SECURITY DEVICE

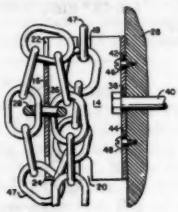
Julio J. Grassi, P.O. Box 3516, Federal Way, Wash. 98003

Filed Jul. 11, 1983, Ser. No. 512,786
Int. Cl.⁴ E05C *17/36*
U.S. Cl. 292—264 **3 Claims**

1. A security device for a door comprising

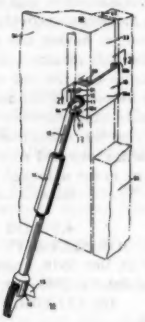
a first bracket member attached proximate one jamb of said door,

a second bracket member attached proximate the other jamb of said door, said second bracket comprising
a generally U-shaped channel member having a first leg, a second leg and a saddle therebetween,
said first leg adapted to be attached proximate said other jamb of said door, said saddle being disposed vertically with the open end of said U-shaped member distal said saddle facing horizontally away from said door,
said second leg comprising
a top end,
a bottom end,
means defining a first and second slot disposed, respectively, proximate the top and bottom ends of said second leg,
said saddle comprising
a top end,



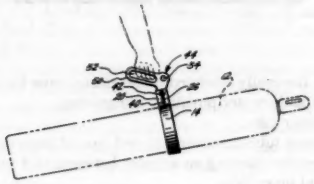
means defining a third slot disposed proximate said top end of said saddle,
a chain having a first end and a second end, said first end connected to said first bracket member with one link of said chain located between said first bracket member and said second end of said chain engaging said third slot of said second bracket member proximate said top end of said saddle, another link of said chain located between said third slot and said second end of said chain engaging said second slot of said second bracket member proximate the bottom end of said second leg, and another link of said chain located between said second slot and said second end of said chain engaging said first slot of said second bracket member proximate the top end of said second leg.

4,560,192
DOOR SECURER
Wilfred W. Wilson, 95 Thorncliffe Park Dr., Apt. 4106, Toronto, Ontario, Canada M4H 1L7, and Albert Schlanger, 43 Old Park Rd., Toronto, Ontario, Canada M6C 3H9
Filed Nov. 9, 1982, Ser. No. 440,180
Int. Cl.[4] E05C *17/54*
U.S. Cl. 292—339 **13 Claims**



1. A door securer for attachment to an edge of a door to inhibit movement thereof in a predetermined direction, said securer comprising a bracket having a pair of spaced arms to receive a door therebetween, a clamp member adjustably mounted on one of said arms to be moveable relative to the other of said arms to clamp the door therebetween, and a brace connected to said clamp member and engagable with a surface to inhibit said movement, said clamp member including a threaded shaft received within threaded aperture in said one arm and rotatable relative thereto to induce movement therebetween and an abutment member located at one end of said shaft to be moved toward said other arm upon rotation of said shaft, said brace being pivotally connected to the other end of said shaft and swingable relative to said shaft through the axis of rotation of said shaft from a stored position in which said brace extends generally perpendicular to the axis of rotation of said shaft to an operative position in which said brace is inclined ot the axis of rotation.

4,560,193
CARRYING DEVICE FOR TRANSPORTING A CYLINDRICAL TANK
Randall Beebe, 1206 - 5th Ave., Picayune, Miss. 39466
Filed May 15, 1984, Ser. No. 610,524
Int. Cl.[4] B65D *63/18*
U.S. Cl. 294—31.2 **5 Claims**



1. A carrying device for transporting an elongated cylindrical tank having a longitudinal axis from its top to its bottom, the device comprising:
a substantially circular collar having an inner face and an outer face, the diameter of circular opening defined by said inner face being greater than the outer diameter of said cylindrical tank;
a plurality of frictional grippers, disposed on the inner face of said collar, each gripper having an arcuate face having a plurality of rows of gripping teeth, the rows extending substantially perpendicularly to the direction of the longitudinal axis of the tank to be carried by the collar, one of said grippers being mobile from a first position in frictionally gripping engagement with the exterior of the tank on which the collar is placed to a second position not in frictionally gripping engagement therewith;
said mobile gripper being provided with a gripping tooth adapted to be moved from a first position in frictionally gripping engagement with the exterior of the tank and a second position not in frictionally gripping engagement therewith;
wherein said mobile gripper is further provided with a means for moving said tooth from said second position to said first position, said means for moving said gripping tooth from said second position to said first position comprising:
a projection on said tooth for placement through an aperture in said collar;
a limit pin carried by said projection;
first and second opposing, substantially parallel flanges, one on each side of said aperture, each of said flanges being provided with a limit slot for cooperatively guiding the limit pin of said projection;
a pivot pin between said flanges; and
a pivotal handle mounted in pivoting engagement on said pivot pin, the pivoting of said handle abutting said limit

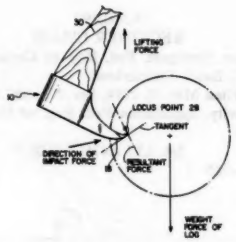
pin and moving said limit pin within said limit slots to move said gripping tooth from said second to said first position.

4,560,194

BLADE AND TOOL FOR ITS USE IN HANDLING MATERIAL, SUCH AS LOGS

Torsten A. Rybeck, N62W28344 Rybeck Rd., Hartland, Wis. 53029

Filed Apr. 4, 1984, Ser. No. 596,841
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—61 **21 Claims**



1. A blade for use in a tool adapted to handle articles which are penetrated by the blade, comprising:

a generally flat blade portion which converges at one end to form means, comprising a sharp tip portion, for penetrating an article and anchoring therein to enable lifting of the article and for enabling easy intentional release of the tip portion from the article, said tip portion having a top edge which has a curved profile terminating at the tip of said blade and having a radius of curvature which becomes progressively smaller in the direction approaching said tip, said top edge forming a portion of a spiral-like line which substantially converges on a locus point beyond said tip; and

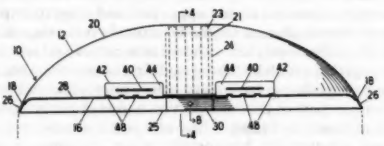
means integral with said blade portion for rigidly attaching the blade portion to a handle member.

4,560,195

AIR DEFLECTOR FOR TRAILERS

William F. Price, and Phillip L. Emery, both of Portage, Wis., assignors to Penda Corporation, Portage, Wis.

Filed Jul. 1, 1983, Ser. No. 509,937
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S **13 Claims**



1. An air deflector for trailers having a forwardly facing front wall with a top edge and opposed side edges, the air deflector comprising:

(a) a body of resilient, flexible, semi-rigid thermoplastic material molded to a desired set shape and having opposed top and bottom margins and opposed side margins and forwardly and rearwardly facing surfaces extending to the margins of the body, the body being adapted to extend generally between the side edges of the trailer front wall and from the top edge thereof to a selected location on the front wall remote from the top edge, the body projecting forwardly from the margins with the forwardly facing surface being generally convex; and

(b) at least one air vent alcove located at the bottom margin of the body having a downwardly facing and substantially horizontal ceiling portion extending rearwardly beneath the overhanging body, and an air vent located in the ceiling portion of the air vent alcove for freely admitting ambient air to the space between the body and the trailer front wall and thereby preventing formation of a vacuum therein which might tend to cause collapse of the body, and

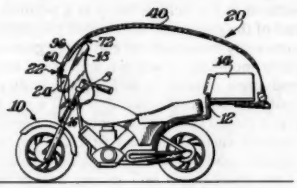
(c) a recoil rib attached to the body at least at each end of the recoil rib and extending generally parallel and adjacent to the shaped rearwardly facing body surface from a selected margin of the body to the margin opposed thereto, the recoil rib being formed of resilient, semi-rigid material to thereby increase the body's ability to resist deformation from force applied to the forwardly facing surface of the body and, upon the release of such force, to aid the body to resume its original shape.

4,560,196

MOTORCYCLE CONVERTIBLE TOP

Richard L. Carter, Sr., 226 Birch Ave. Elsmere, Wilmington, Del. 19805

Filed May 15, 1984, Ser. No. 610,477
Int. Cl.[4] B62J *17/08*
U.S. Cl. 296—102 **4 Claims**



1. A convertible top for a motorcycle vehicle having front steering means comprising:

(a) Rear mounting means at rear of the vehicle;

(b) Base means which are adapted to engage the rear mounting means;

(c) At least two flexible rods, each of which is vertically attached at one end to the base means and positioned over the left and right side of the rear of the vehicle;

(d) A cross-member attached to the other end of the flexible rods so that the rods are maintained in parallel alignment to the longitudinal axis of the vehicle;

(e) A fabric cover having a top end and back end and said cover having a plurality of lateral support members each of which has two side openings, said openings in each support member being aligned with an opening on an adjacent support member whereby each of the flexible support rods are passed through each of the openings on one side of the lateral support members and the lateral support members slidably engage the flexible support rods thereby allowing the fabric cover to be raised and lowered to provide covering over the vehicle rider;

(f) Attachment means at the front and rear of the fabric cover for attaching the fabric cover to the cross member and the base means; and

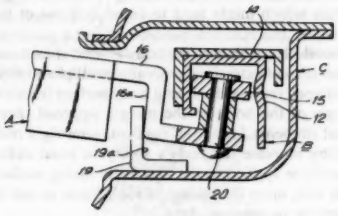
(g) Front mounting means on the front steering means of the vehicle, said front means being adapted to engage and hold the cross-member and thereby hold the flexible rods and the fabric cover in an arcuate configuration over the vehicle rider.

4,560,197

DEVICE FOR GUIDING A VEHICLE SLIDING DOOR

Tatsuo Minami, Isehara, Japan, assignor to Nissan Shatai Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1983, Ser. No. 475,336
Claims priority, application Japan, Jun. 30, 1982, 57-98764[U]
Int. Cl.[4] B60J 5/06; E05D 13/00
U.S. Cl. 296—155 6 Claims



1. A device for guiding a sliding door on the body of a vehicle, comprising:

a guide rail for said sliding door, said rail being mounted on said body and extending generally in the front to rear direction of said vehicle;

a bracket mounted on said sliding door, said bracekt having a first wall and a guide roller rotatably disposed to travel along said rail, said guide rail being mounted on said vehicle body;

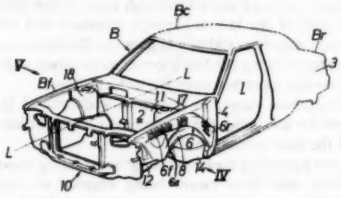
a stopper piece, separate from the guide rail and fixedly secured to the vehicle body at a position adjacent to one end of the guide rail, the stopper piece positioned laterally outwardly from said one end of the guide rail, said stopper piece including a second wall, said second wall being positioned relative to said vehicle body outside said first wall and opposite to said first wall when said sliding door is at a closed position, an open space separating the entire opposed surfaces of said first and second walls in said opposite position when said door is closed, said first wall of the bracket and said second wall of the stopper piece not interfering with each other when the sliding door is opened and closed in normal operation, said first wall coming into contact with said second wall, which thereafter restrains said first wall, when said guide roller is inclined by an external force applied to the sliding door, said force pulling said door away from the vehicle body.

4,560,198

CAR BODY OF A MOTORCAR

Hiroki Katano; Hisato Nishida, both of Tokyo; Katsumi Semba, Asaka; Kouji Enomoto, Kawasaki, and Kazu Uchida, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,623
Claims priority, application Japan, Apr. 13, 1983, 58-64873
Int. Cl.[4] B62D 21/00, 25/08
U.S. Cl. 296—185 14 Claims



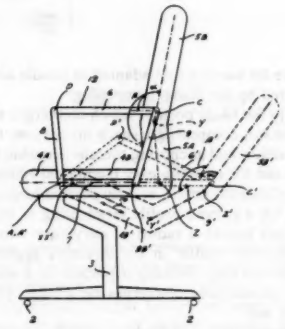
1. In a car body for a motorcar of the type having a section constituting an engine compartment joined to a section constituting a passenger compartment, said engine compartment section including a pair of side frames at the opposite longitudinal sides of said engine compartment, each of said side frames including a lower longitudinal strut member and an upper skeleton frame, said lower longitudinal strut members and said upper skeleton frames being connected to vertically extending pillars between said passenger compartment section and said engine compartment section, the improvement wherein each of the upper skeleton frames extends outwardly and upwardly away from said pillar and is fixedly connected at its inward end to said pillar in an area no higher than the vertical middle part of said pil.ar.

4,560,199

RECLINER CHAIR

Richard Sapper, Stuttgart, Fed. Rep. of Germany, assignor to Pamont AG, Basel, Switzerland

Filed Mar. 9, 1984, Ser. No. 587,939
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326433
Int. Cl.[4] A47C 1/032
U.S. Cl. 297—323 10 Claims



1. A chair, comprising a seat support; a seat portion connected to said seat support; a back portion connected to said seat portion, said seat portion with said back portion being swingable from a normal sitting position to a backward-leaning rest position and backwards from the backward-leaning rest position to the sitting position, said seat portion including a forward part rigidly connected to said seat support and a rear part pivotally connected to said forward part and adapted to pivot in a downward direction about a first horizontal pivot axis; said back portion including an upper part and a lower part pivotally connected to said upper part and adapted to pivot in respect thereto about a second horizontal pivot axis, said lower part pivotally connected with said rear part of said seat portion and together pivotable about said first horizontal axis; and at least one quadrangular linkage means interconnected between said upper part of the back portion and said seat portion, said linkage means including a first arm and a second arm which extend substantially horizontally when the chair is in said sitting position, said second arm being rigidly connected to said seat support, a forward third arm pivotally connected to said first arm at a first pivoting connection and pivotally connected to said second arm at a third pivoting connection, and a rear fourth arm pivotally connected to said first arm at a second pivoting connection and pivotally connected to said second arm at a fourth pivoting connection; said first arm having a rear end rigidly connected to a lower end of said upper part of the back portion, said second arm having a forward end and said third arm having a lower end which are pivotally connected with respect to each other and to said forward part of the seat portion at said third pivoting connection near said first

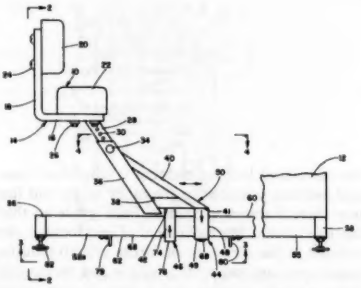
horizontal pivot axis, said second arm being a rigid carrier for said forward third arm and a pivot point for said rear fourth arm.

4,560,200

QUICKLY DISENGAGABLE LOCK FOR ADJUSTABLY POSITIONED SEAT

Raymond Giannelli, Ronkonkoma, and Matthew R. Martin, Sayville, both of N.Y., assignors to Lumex, Inc., Bay Shore, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,138
Int. Cl.⁴ A47C *1/06*
U.S. Cl. 297—340 **9 Claims**



1. An adjustable seat assembly, comprising:
a horizontal seat for supporting the weight of a person in sitting position;
a pedestal supporting said seat in an elevated position;
a base frame having fixed horizontal side rails and feet secured to said base frame to elevate same;
a carriage slidably mounted on said base frame, said pedestal secured to said carriage, so that said seat is movable forwardly and rearwardly above and parallel to said rails said carriage comprising:
first and second rectangular frames extending around said base frame;
said first frame having a first top cross bar bearing on tops of said rails, and a first bottom cross bar spaced from the undersides of said rails;
said second frame having a second top cross bar spaced from the tops of said rails, and a second bottom cross bar abutting the undersides of said rails;
said first frame being disposed between said second frame and said seat longitudinally of said rails; and
catch means carried by said carriage engaged with one of said rails to prevent movement of said carriage along said rails, said catch means so arranged that slight elevation of said seat in one direction in a vertical plane with respect to said base frame will disengage said catch means from said rail to permit movement of said carriage along said rails, whereby slight depression of said seat in a direction opposite to said one direction will re-engage said catch means with said rails.

4,560,201

HEADREST FOR SEDENTARY TRAVELER

Samuel C. Scott, 4575 Joliet St., Denver, Colo. 80239

Filed Mar. 19, 1984, Ser. No. 591,168
Int. Cl.⁴ A47C *16/00*
U.S. Cl. 297—393 **8 Claims**

1. A head support device which allows a user to rest while sitting in a generally upright position, the device comprising:
(a) a holding means for supporting the user's head in a forward leaning position to restrain him from moving further forward and sideways, said holding means having means for contacting the upper portion of the head of the user;
(b) a connecting means having an elongated flexible portion which is attached at one end to said holding means and the other end left free;
(c) said free end of the connecting means having securing means for securing and adjusting the length of said connecting means, said securing means being arranged to be wrapped around and secured to a supported object

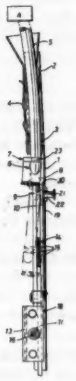
whereby the holding means securely supports the head of the user in the forward leaning position to allow the neck muscles to relax and permit the user to rest or sleep; and
(d) said holding means and connecting means are formed from a single piece of flexible strap material with said holding means formed as a loop at one end of said strap and including strap means which passes over the top of the user's head to support the holding means in proper position contacting the head of the user.

4,560,202

HEADREST OF A MOTOR VEHICLE SEAT

Erwin Koelle, Sindelfingen, and Josef Klink, Nagold, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,261
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246778
Int. Cl.⁴ A47C *1/10*
U.S. Cl. 297—410 **17 Claims**



1. A headrest means for a motor vehicle seat which is vertically displaceable by remote control means for adjusting movement comprising:
rack means;
gearwheel means for transmitting said adjusting movement to said rack means;

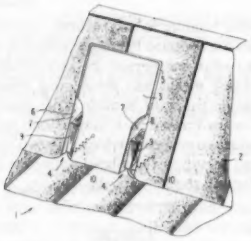
at least one support rod;
sliding means for guiding movement of said support rod;
rail means extending in the direction of said support rod for slidably connecting said support rod to a backrest frame of said seat;
coupling means projecting from the top end of said rack means for releasably engaging said support rod at the free end of said rod; and
housing means for receiving said gearwheel means and guiding said rack means supported on said rail means.

4,560,203

INSTALLATION FOR STORING NON-NEEDED BELT LOCK PARTS COORDINATED TO A MOTOR VEHICLE BACK SEAT

Guntram Huber, Keplerstrasse 24, 7031 Aidlingen 2, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,590
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316607
Int. Cl.[4] B60R *21/60;* **A47D** *15/00*
U.S. Cl. 297—481 **2 Claims**



1. An installation for accommodating and storing non-needed seat belt buckle parts coordinated to a motor vehicle back seat provided with recess means in the front side thereof, comprising an armrest operable to be folded out of the backrest, said recess means being provided along side surfaces of said armrest and forming together with adjoining backrest walls pocket means, said pocket means including bottom areas constructed as deflection surfaces that during pivoting of the armrest out of the backrest transfer the belt buckle parts accommodated thereat into their use position.

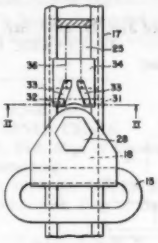
4,560,204

HEIGHT-ADJUSTMENT DEVICE FOR A MOTOR-VEHICLE SAFETY BELT

Monika Zeümer, Hamburg, and Klaus Straszewski, Verl, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,508
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242593
Int. Cl.[4] A62B *35/02*
U.S. Cl. 297—483 **16 Claims**

1. A device for adjusting the height of the upper mounting or guide fitting of the safety belt of a motor vehicle; said device comprising:
a guide rail having two sides on which are successively arranged, one above the other, arresting openings;
a slide which is movable in said guide rail and carries said guide fitting;
locking elements adapted to engage in said arresting openings, said locking elements being displaceable transversely to the direction of movement of said slide, against spring pressure, from one extreme position, a locked position, into a second extreme position, an unlocked position, and vice versa; at least one of said locking elements being provided with a first extension;
at least one push button for effecting said displacement of said locking elements; and
a guide member which is operatively connected with said at least one push button, and is provided with at least one inclined guide into which said at least one first extension of said locking elements engages; the length and path direction of said at least one inclined guide being such that



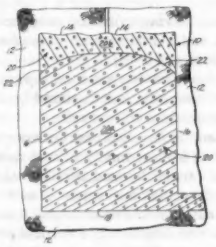
the associated locking element is displaced from one of said extreme positions to the other when said first extension thereof traverses said inclined guide so that on the one hand unlocking movement of said locking elements is avoided in the direction of forces effective during a side impact encountered by the vehicle and on the other hand there is made possible that a push button movement is converted into a locking movement arranged at right angles thereto via said inclined guide.

4,560,205

METHOD FOR CONTROL OF GEOMETRY OF FRAGMENTED MASS IN AN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 6, 1984, Ser. No. 628,448
Int. Cl.[4] E21B *43/247;* **E21C** *41/10;* **C10B** *57/20*
U.S. Cl. 299—2 **36 Claims**



1. A method for explosively expanding a layer of unfragmented formation downwardly toward a free face that overlies a void space having a nonlevel bottom surface to thereby substantially completely fill the void space and the volume originally occupied by the layer of unfragmented formation with a fragmented permeable mass of formation particles, the method comprising the steps of:
(a) determining the vertical distance from each of a plurality of locations on the free face to the nonlevel bottom surface of the void space to thereby determine the shape of the void space; and
(b) explosively expanding the layer of unfragmented formation by explosively expanding a plurality of separate horizontally spaced regions within the layer of unfragmented formation in a selected sequence, there being a time delay

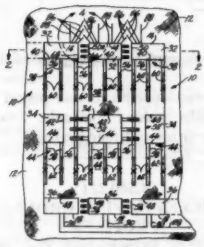
between explosive expansions in the sequence, wherein the average vertical distance from the free face of such a region expanded earlier in the sequence to the void space bottom surface is greater than the average vertical distance from the free face of any such region expanded later in the sequence to the void space bottom surface.

4,560,206

METHOD FOR EXPLOSIVELY EXPANDING A PILLAR

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 26, 1983, Ser. No. 517,363
Int. Cl.⁴ E21C *41/00*
U.S. Cl. 299—2 **48 Claims**



35. A method for forming an in situ oil shale retort in a retort site in a subterranean formation containing oil shale, the in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale within top, bottom and generally vertically extending side boundaries of unfragmented formation, the method comprising the steps of:

(a) excavating a void within the retort boundaries in the subterranean formation while leaving zones of unfragmented formation above and below the void and at least one support pillar of unfragmented formation in the void, the roof of the void being the top boundary of the retort being formed and the floor of the void being the top surface of the underlying zone of unfragmented formation, the top of such a pillar adjoining the void roof and the bottom of such a pillar adjoining the void floor;

(b) placing explosive charges into the underlying zone of unfragmented formation for explosively expanding the underlying zone toward the void;

(c) placing a plurality of rock bolts into the roof of the void at angles toward such a pillar so that at least a portion of such rock bolts converge in the formation directly above the pillar;

(d) placing a plurality of explosive charges into the pillar for expanding the pillar toward the void; and thereafter

(e) detonating the explosive charges to thereby form the fragmented permeable mass of formation particles in the retort by the steps of:

(i) detonating all of the explosive charges in the pillar; and thereafter

(ii) detonating the explosive charges in the underlying zone of unfragmented formation.

4,560,207

METHOD AND APPARATUS FOR FRAGMENTING ASPHALT

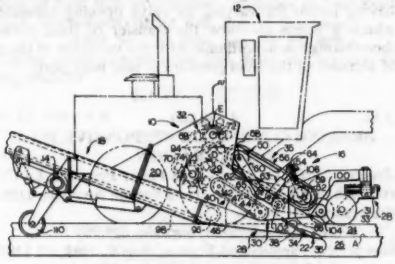
Larry G. Eftefield, Edelstein; Gerald P. Simmons, Morton, and Gregory L. Stone, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 1, 1984, Ser. No. 585,051
Int. Cl.⁴ E21C *37/00*
U.S. Cl. 299—10 **19 Claims**

1. An apparatus for removing a ribbon of asphalt from an underlying base and fracturing the asphalt ribbon into fragments of predetermined size, said apparatus comprising:

means for separating an asphalt ribbon from laterally adjacent asphalt and from the underlying base;

means for guiding and elevating the asphalt ribbon to a predetermined height; and



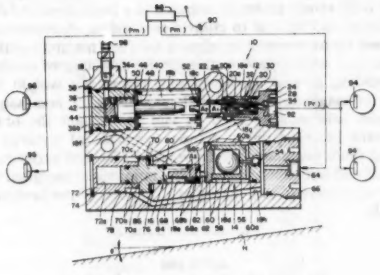
means for displacing the asphalt ribbon after said predetermined height in opposite transverse directions at longitudinally and laterally separated locations and bendingly fracturing the asphalt ribbon into fragments of predetermined size.

4,560,208

BRAKE PRESSURE CONTROL UNIT OF DECELERATION-RESPONSIVE TYPE

Hitoshi Kubota, Minamiashigara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 26, 1983, Ser. No. 517,410
Claims priority, application Japan, Jul. 27, 1982, 57-130843; Feb. 24, 1983, 58-28625
Int. Cl.⁴ B60T *8/14*
U.S. Cl. 303—6 C **11 Claims**



1. A brake pressure control unit of the deceleration-responsive type comprising:

a housing having an inlet port and an outlet port;

a control valve disposed in said housing between said inlet and outlet ports and operable to restrict the transfer of fluid pressure therethrough, said control valve having a spring by which it is biased to a position of opening;

a storing chamber disposed in said housing and communicable with said inlet port, said storing chamber being variable in volume depending upon the variation of the fluid pressure supplied thereto and operatively connected to said control valve in a manner to urge the control valve in the direction to assist the bias of said control valve spring with an increasing force as the fluid pressure in the storing chamber increases;

a deceleration-responsive valve disposed in said housing between said inlet port and said storing chamber and

operable to sealingly close said storing chamber in response to a vehicle deceleration at a rate exceeding a predetermined value; and

a differential pressure valve disposed in said housing between said deceleration-responsive valve and said storing chamber and operable to restrict the transfer of fluid pressure therethrough, said differential pressure valve having means for varying its valve opening pressure at which it opens to allow the transfer of fluid pressure therethrough in accordance with the variation of the rate of increase of the fluid pressure at said inlet port.

4,560,209

BRAKING CORRECTOR RESPONSIVE TO DECELERATION

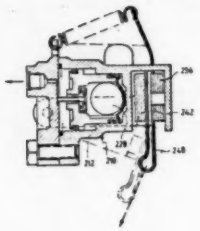
Jean-Jacques Carré, Le Raincy, and Pierre Pressaco, La Courneuve, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Aug. 3, 1983, Ser. No. 519,951

Claims priority, application France, Aug. 9, 1982, 82 13850

Int. Cl.⁴ B60T *8/26, 8/14;* G05D *16/02, 16/04*

U.S. Cl. 303—22 R **4 Claims**



1. A braking corrector responsive to the deceleration of a vehicle, comprising a casing having a corrector valve therein, an inertia weight mounted for movement inside said casing away from return means in response to a predetermined deceleration of said vehicle to control said valve, characterized in that said return means comprises at least one magnet positioned at the rear, with regard to the normal direction of motion of the vehicle, of said inertia weight, the inertia weight being made of magnetic material and said casing of non-magnetic material, said magnet fixed to said casing and the braking corrector incorporating a component made of material possessing finite magnetic resistance and interposed between said magnet and said inertia weight, the component mounted so as to move relative to said casing as a function of the load on the vehicle.

4,560,210

BRAKE SYSTEM FOR VEHICLES

Masanori Tani; Shin'ichi Eto, and Takeshi Funakoshi, all of Aichi, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 9, 1983, Ser. No. 521,602

Claims priority, application Japan, Aug. 14, 1982, 57-141320; Feb. 14, 1983, 58-19072[U]; Feb. 14, 1983, 58-19073[U]; Feb. 24, 1983, 58-25050[U]; Feb. 24, 1983, 58-25051[U]

Int. Cl.⁴ B60T *8/18, 8/26*

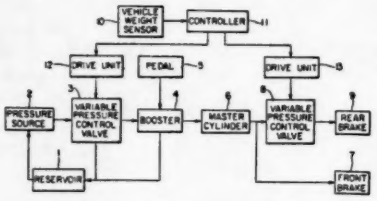
U.S. Cl. 303—22 R **7 Claims**

1. A brake system for a vehicle comprising:

booster means including a cylinder, a piston disposed for sliding movement in said cylinder, a pressure chamber defined between said cylinder and said piston, and a valve member arranged for interlocking movement with a brake pedal and disposed slidably in said piston for controlling flow of pressure fluid from a fluid pressure source into said pressure chamber;

pressure control valve means disposed between said fluid pressure source and said booster means and operative to control a permissible maximum pressure generated in said pressure chamber of said booster means;

control means for controlling the operation of said pressure control valve means so as to change said permissible maximum pressure depending on a change of the weight of the vehicle; and



a master cylinder connected to said piston of said booster means to supply braking hydraulic fluid at controlled pressure to the front and rear brakes.

4,560,211

TRACKED VEHICLES HAVING GROUND ENGAGING PROFILES

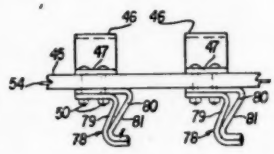
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 207,341, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 900,157, Apr. 26, 1978, abandoned. This application Nov. 12, 1982, Ser. No. 441,267

Claims priority, application Netherlands, Jun. 30, 1977, 7707261

Int. Cl.⁴ B62D *55/26*

U.S. Cl. 305—35 EB **3 Claims**



1. An agricultural vehicle included in the group which comprises tractors, soil cultivating machines, and the like which include a lifting device, the vehicle comprising an engine and power train extending therefrom, said vehicle having a track arranged around at least two pneumatic tires mounted on ground wheels of the vehicle which are arranged in tandem, the axles of said wheels supported in a beam whereby the distance between said axles is constant, said track comprising a belt having a width which is uninterrupted for at least the entire width of said tires' tread and a plurality of outwardly extending profiles and inwardly extending teeth mounted thereon, each said profile consisting entirely of metal and as viewed from the side having a height which exceeds its width, each said profile being S-shaped with the lower leg of the "S" being flat and extending substantially parallel to the portion of said belt from which it extends, said teeth engaging said tires for driving said track and, viewed from one side, the width of each of said teeth being larger than the distance between two adjacent said teeth, each of said teeth rigidly connected to one of said profiles, only the rearmost of said ground wheels being connected to said power train whereby it is driven by said engine and the forward of said ground wheels is driven by said belt, said belt being embedded with longitudinally extending steel wires of such a character that it is relatively inelastic in the longitudinal direction, said belt being in a state of tension wherever it contacts the ground when said vehicle is being

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driven forward and said profiles exerting rearwardly and downwardly inclined forces on the upper layer of the ground of such a character that packing of the soil is substantially reduced.

4,560,212

THREE PART BALL BEARING SLIDE WITH LOCKABLE INTERMEDIATE SLIDE MEMBER

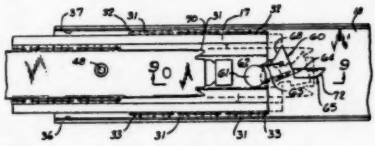
John E. Papp, Anaheim, and Antony S. Reed, Whittier, both of Calif., assignors to Standard Precision, Inc., Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 540,006, Oct. 7, 1983. This application Apr. 6, 1984, Ser. No. 597,674

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.⁴ F16C *29/04*; A47B *88/00*

U.S. Cl. 308—3.8 **5 Claims**



1. In a lock-out or stop out and disconnectable three member slide mechanism for locking or stopping a telescoping slide in an extended position while permitting the slide to be disconnected, said slide mechanism comprising:

an outer slide member having two inwardly-facing, parallel grooves formed along the edges thereof, said outer slide member having an outer end from which the slide telescopes and an inner end toward which the slide retracts;

a first ball bearing retainer having a plurality of ball bearings held therein, said retainer being movable within and along said outer slide member and being positioned to hold the ball bearings in two axial rows one of said rows being held along and against the first of said two parallel grooves and the other of said rows being held along and against the second of said parallel grooves;

an intermediate slide member having two outwardly-facing parallel grooves and two inwardly-facing parallel grooves formed along the edges thereof, said intermediate slide member being slideable along the interior of the outer slide member and having the ball bearings which are held in the first ball bearing reatiner touching the outwardly-facing grooves thereof;

a second ball bearing retainer having a plurality of ball bearings held therein, said retainer being movable within and along said intermediate slide member and being positioned to hold the ball bearings in two axial rows one of said rows being held along and against the first of said two inwardly-facing parallel grooves and the other of said rows being held along and against the second of said inwardly-facing parallel grooves;

an inner slide member having two outwardly-facing parallel grooves formed along the edges thereof, said inner slide member being slideable along the interior of the interior slide member and having the ball bearings of the second ball bearing retainer touching the grooves thereof wherein the improvement comprises:

an intermediate lock-out latch pivotally held on said intermediate slide member near the inner end thereof, said intermediate lock-out latch having a stop surface at the inner end thereof and a cam surface extending in the path of travel of the inner slide member and further having biasing means urging the intermediate lock-out latch in the path of the inner slide member and wherein the outer slide member has stop means held thereon, said stop means being positioned so that the stop surface of the intermediate lock-out latch touches the stop means on the outer slide member when the intermediate slide member is fully extended from the outer slide member.

4,560,213

GAS BEARING

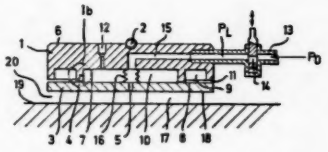
Eckhard Enderle, Aalen, and Dieter Kaufmann, Heidenheim, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,000

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343470

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 308—5 R **23 Claims**



1. A gas bearing the support side of which is developed as a resilient membrane (3) which is concavely shaped by the bearing pressure (P_L), characterized by the fact that the membrane (3) rests on tilt bearings (22) whose distance apart is less than the size of the membrane (3) and a chamber (9, 10) formed by the membrane (3) and a bottom (7) of a bearing housing (1), is at least partially vented.

4,560,214

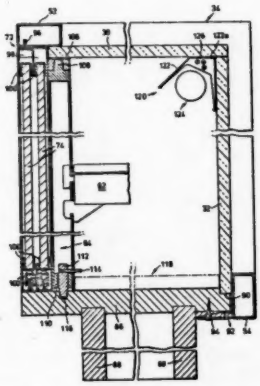
SHOW CASE

Martin Otema, 51 Pine Ridge Dr., Scarborough, Ontario, Canada (M1M 2X6)

Filed Dec. 2, 1983, Ser. No. 557,516

Int. Cl.⁴ A47F *3/12*

U.S. Cl. 312—114 **16 Claims**



1. A show case comprising:

a carcass structure which includes a base and end walls extending generally vertically upwards from the base and defining with the base a space for receiving merchandise to be displayed, the end walls having respective top and front edges against which can be positioned respective top and front panels extending between the end walls, for enclosing merchandise in said space;

panel retaining frame means comprising a unitary frame

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including frame members arranged to overlie said edges of the end walls and trap against said edges, intervening portions of said panels so that the panels are held in place on the carcass structure by said frame means, and top and bottom cross frame members at which said frame is removably secured to the carcass structure; and,

means removably securing the frame means to the carcass structure, comprising hinge means coupling said bottom cross frame member to said structure and at least one retaining element for releasably securing said top frame member to said structure;

the show case having a back which is at least initially open and including a peripheral frame defining said back and including top and bottom frame members, said frame being secured to said end walls of the carcass structure, and wherein said retaining element for said panel retaining frame comprises at least one screw extending upwardly through said top frame member and into said top cross member of the panel retaining frame means, whereby said retaining screw is accessible at the rear side of the show case only.

4,560,215

COMPUTER DESK

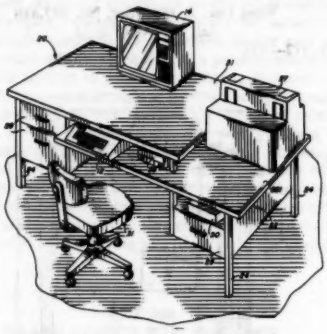
Jeffrey A. Turner, 2901 W. Laurel La., Phoenix, Ariz. 85029

Continuation of Ser. No. 246,143, Mar. 23, 1981, Pat. No. 4,449,762. This application May 17, 1984, Ser. No. 611,340

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.⁴ A47B *57/00*

U.S. Cl. 312—196 **9 Claims**



1. A computer desk for use with a computer keyboard terminal while preserving a clear desk top work space comprising:

an unencumbered planar desk top work surface;

means for emplacing and fully supporting a computer keyboard terminal below said desk top work surface comprising a support surface coupled below said desk top work surface a distance sufficient to provide support for a computer keyboard terminal; and

said desk top work surface and said support surface each comprises an edge nominally facing a user seated at said desk and said edge of said support surface is advanced toward said user to permit support of the keyboard of a computer keyboard terminal while providing convenient usable access to the keyboard of a terminal so emplaced and supported unimpeded by said desk top work surface.

4,560,216

CONNECTOR WITH COMPONENT REMOVAL MEANS

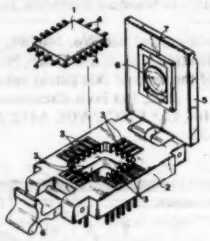
Yoshinori Egawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 548,137

Claims priority, application Japan, Mar. 22, 1983, 58-40953[U]

Int. Cl.⁴ H05K *1/00*; H01R *13/62*

U.S. Cl. 339—12 V **4 Claims**



1. An IC socket with means for removing an IC package mounted therein and which has terminals to be brought into contact with terminals of the IC socket, said IC socket comprising:

a socket body having a recess therein for receiving the IC package and having terminals therearound with which the terminals of the IC package are engaged;

a cover pivotally attached to one end of said socket body pivotable to a closed position over said recess;

lock means pivotally attached to the other end of said socket body and engageable with the free end of said cover to hold said cover in the closed position;

a suction cup attached to the under side of said cover for snugly retaining the IC package in said recess in said socket body when said cover is locked and holding said IC package thereon by suction when said cover is opened relative to said IC socket body for removing the IC package from said socket body, said cover having a bore therethrough and a flange receiving recess around said bore on the outside of said cover, and said suction cup having a mounting stem thereon extending through said bore and a flange on the end of said mounting stem seated in said flange receiving recess, said cover having on its inside surface a pressing portion projecting inwardly toward the recess in said socket body for pressing the terminals of the IC package firmly into contact with the terminals of said socket body when said cover is closed, and said suction cup being inside said pressing portion and having the suction end projecting slightly outwardly from the free end of said pressing portion, whereby the IC package held on said suction cup is spaced slightly from said pressing portion when said cover is opened.

4,560,217

CHIP CARRIER CONNECTOR

Frank S. Siano, Monroe Township, Middlesex County, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 17, 1983, Ser. No. 524,044

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 339—14 R **14 Claims**

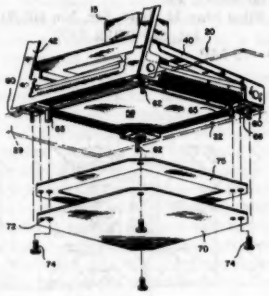
1. A connector for connection to a circuit element carrier comprising:

a rectangular body having two pairs of opposed upstanding sides, each side having an exterior edge, said body defining interiorly of said sides a central cavity for receipt of said circuit element carrier;

a plurality of electrical spring contacts supported on said sides of said body and extending into said central cavity;

a first rectangular plate-like arm member pivotally sup-

ported on one of said sides and having a distal extent extending toward the opposite side thereof thereby spanning said central cavity, said first arm member being supported for pivotal movement into overlying engagement with said circuit element carrier for urging said circuit element carrier into resilient electrical engagement with said spring contacts;



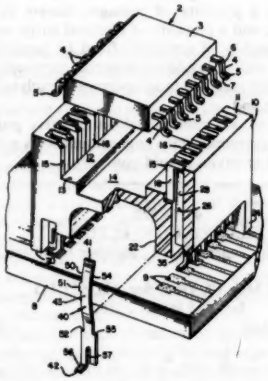
a second rectangular plate-like arm member pivotally supported on said opposite side at a location interior of an exterior edge thereof for pivotal movement into overlying engagement with said first arm member for urging said first arm member into engagement with said circuit element carrier, said distal extent of said first arm member being disposed for positioning exteriorly of said pivotal support location of said second arm member.

4,560,218

SOCKET FOR SURFACE MOUNT DIP

Timothy B. Billman, King; James R. Coller, Kernersville, and Gary R. Marpoe, Jr., Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 3, 1984, Ser. No. 677,154
Int. Cl.[4] H01R *23/72*
U.S. Cl. 339—17 CF **8 Claims**



1. A socket for an integrated circuit package of the type having two opposed rows of leads formed with laterally projecting feet for mounting against surface contacts on a printed circuit board, said socket comprising

a dielectric housing having a package receiving face and an opposed board mounting face with two parallel rows of apertures extending therebetween, the package receiving face having therein a package receiving nest having a floor flanked by parallel opposed sidewalls, the sidewalls of the nest having respective parallel rows of channels therein, each aperture having a pair of opposed sidewalls paralleling the sidewalls of the nest and a pair of opposed endwalls substantially perpendicular thereto, the apertures in each row intersecting respective channels, a row of said channels being spaced to receive said feet when said package is placed in said nest,

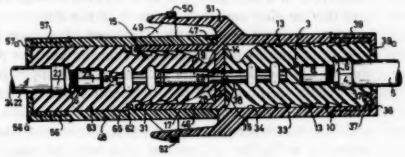
a plurality of elongate formed contacts lying in respective apertures, each contact having first and second sheared surfaces facing respective sidewalls of the aperture and opposed first and second rolled surfaces facing respective endwalls thereof, each contact having a first end proximate said package receiving face and an opposed second end formed with a foot proximate the mounting face, each contact being bowed intermediate said ends to form a leaf spring having a convex surface and a concave surface, which face respective opposed endwalls, the apex of the convex surface being located so that the leaf springs resiliently engage the feet of the package leads in the channels when the package is inserted in the nest.

4,560,219

WATERPROOF ELECTRICAL CONNECTOR

Raymond Chapelot, Lagny sur Marne, France, assignor to Precision Mecanique Labinal, Bois D'Arcy, France

Filed Nov. 7, 1983, Ser. No. 550,183
Claims priority, application France, Nov. 9, 1982, 82 18782
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—60 R **32 Claims**



1. A waterproof electrical connector for connecting electrical conductors, comprising:

(a) male electrical contact member adapted to be connected to an electrical conductor;

(b) female electrical contact member adapted to be connected to an electrical conductor, said male and female electrical contact members comprising a male and a female complementary plug respectively, adapted to mate with each other to create an electrical connection;

(c) insulating wall having an opening therein adapted to receive said male complementary plug;

(d) male block of insulating material in which said male electrical contact member is embedded; and

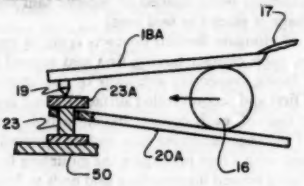
(e) female block of insulating material in which said female electrical contact member is embedded; wherein said male and female members are embedded in their respective blocks so that said male and female plugs are free to mate with each other, each of said blocks comprising a pressure-actuated sealing means at a first end of said block for substantially sealing said electrical connection against contact with water when said male complementary plug is inserted into said opening and into said female complementary plug and both of said sealing means are pressed against said wall, wherein said pressure-actuated sealing means comprises an elastic cup having a concave cross section.

4,560,220

ETCHED MULTICHANNEL ELECTRICAL CONNECTOR

Helmut H. Pistor, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 1, 1984, Ser. No. 605,960
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—74 R **4 Claims**



1. A multichannel electrical connector clip assembly for applying electrical contact pressure between a plurality of contact posts on a printed circuit board (PCB) and a plurality of off-PCB electrical contacts, the connector clip assembly comprised of:

a multiple contact clip assembly at one end of a multiconductor cable which is connectable to said plurality of contact posts wherein said assembly is comprised of an elastic contact pin reed plate having a base region and a pin reed end comprised of a plurality of elastic pin reeds with a contact pin on each of the disattached end portions thereof opposite the contact pin reed plate base region and an elastic slot reed plate having a base region and a slot reed end comprised of a plurality of elastic reeds having a beveled end face with semicircular notched slots cut therefrom in which an upper lip is formed between the slot and the beveled end face on each of the disattached end portions thereof opposite the slot reed plate base region, said slots are of such dimensions that the contact posts fit therein and are frictionally locked by said upper lip after the elastic reeds on said slot reed end are flexed laterally by the force of said contact pins sliding along said beveled end face and over said upper lip and into said slots, said assembly is further comprised of a beveled spacer positioned between said base regions of said contact pin reed plate and said slot reed plate wherein said spacer separates said plates at about 6° angle at said disattached end portions when said elastic plates are in their natural relaxed position in which the contact pins are positioned within the slots; and

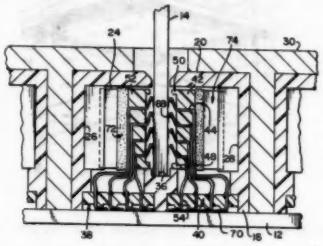
a connect/disconnect means comprised of a spreader rod and slide mechanism wherein the spreader rod is positioned laterally between said contact pin reed plate and said slot reed plate and is attached to said slide mechanism wherein said slide mechanism extends out each side of said plates wherein the spreader rod flexes said contact pins out of said slots as the slide mechanism is moved toward the disattached end portions of said reeds and the contact pins are relaxed back into the at rest state of being within the slots when said spreader rod is moved back to the base region between the contact pin reed plate and the slot reed plate so that selective application of electrical contact pressure between each of said plurality of contact posts on the PCBs and the contact pin on each of said plurality of elastic pin reeds is by sliding said spreader rod to the disattached end portions to flex the plurality of contact pins away from the plurality of slots before said contact posts are friction locked or unlocked as desired within the slots without contact between said contact pins and said contact posts and by sliding said spreader rod back to the base region between the contact pin reed plate and the slot reed plate to relax said plurality of contact pins directly back onto said contact posts to provide electrical contact there between after said contact posts are friction locked into said slots.

4,560,221

HIGH DENSITY ZERO INSERTION FORCE CONNECTOR

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 14, 1984, Ser. No. 609,916
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 339—75 MP **7 Claims**



1. A zero insertion force mother/daughter board circuit connector having very high contact density capabilities, said connector comprising:

an elongated housing of rigid insulative material defining a mother circuit board receiving face and an oppositely directed daughter circuit board receiving face having an elongated aperture therein, said housing further defining an interior cavity;

a daughter circuit board receiving member secured in said housing opposite and spaced from said aperture;

a pair of contact assemblies mounted in said cavity in opposition on opposite sides of said daughter circuit board receiving member;

a like pair of cam assemblies each mounted in said cavity between an outer wall thereof and a respective contact assembly, wherein each said contact assembly comprises first and second elongated insulative contact members each having a plurality of passages therein in parallel spaced rows, and a plurality of terminal strips each comprising a plurality of terminals fixed in parallel spaced relation on a web of insulative material, each said terminal having one end received in an aperture in each said insulative member; and

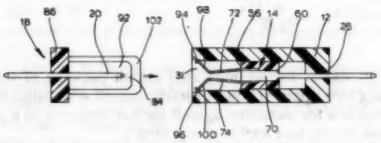
means to actuate said cam assemblies to drive portions of said contact assemblies into engagement with a daughter circuit board received in said connector.

4,560,222

DRAWER CONNECTOR

Philip J. Dambach, Naperville, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed May 17, 1984, Ser. No. 611,441
Int. Cl.⁴ H01R *13/62*
U.S. Cl. 339—75 MP **8 Claims**



1. An intermediate connector assembly providing selective

electrical interconnection between a header having a pin conductor mounted in a dielectric wafer and a remote female connector having at least one female terminal, said connector assembly comprising:

a dielectric housing having a header receiving cavity, with an opening communicating with said cavity and an interior camming surface facing said cavity,

a dielectric carrier mounted within said header receiving cavity for movement between an unterminated position and a terminated position in response to said header being moved from a withdrawn position to a fully inserted position within said cavity,

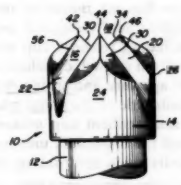
a rigid unitary terminal mounted on said carrier for movement therewith, said terminal including a female portion mateable with said pin conductor and a male portion mounted for movement relative to said housing for selective mating and unmating with said female terminal, said female portion having spaced-apart resilient contact portions for receiving said pin conductor therebetween and cam means engageable with said housing camming surface as said carrier is moved between said unterminated and said terminated positions, said contact portions being movable relative to each other between pin engaging and pin releasing positions in response to the cam means engaging said camming surface.

4,560,223

SELF-CLEANING TRI-CUSP SIGNAL CONTACT

James S. Cooney, Attleboro, and Stephen A. Boyle, Seekonk, both of Mass., assignors to Pylon Company, Inc., Attleboro Falls, Mass.

Filed Jun. 29, 1984, Ser. No. 626,402
Int. Cl.[4] G01R *1/06*
U.S. Cl. 339—95 R 4 Claims



1. A self-cleaning tri-cusp signal contact, comprising:

a shaft defining a longitudinal axis;

a head, having an outer surface, integrally formed on one end of said shaft and symmetrically about said longitudinal axis;

said head consisting of three longitudinally extending and circumferentially spaced cusps each having a free end;

circumferentially adjacent ones of said cusps defining therebetween a corresponding one of three circumferentially spaced grooves, each radially extending in a direction generally transverse to said longitudinal axis of said shaft, that intersect and define a nadir located on the longitudinal axis and interior of said head at a point spaced from the orthogonal projection of the free ends of said cusps on the longitudinal axis;

each of said free ends of said cusps including first and second beveled surfaces integrally formed with said outer surface that respectively intersect circumferentially adjacent ones of said grooves defining first and second external knife edges where said first and said second beveled surfaces respectively intersect corresponding ones of said circumferentially adjacent grooves, said first and said second beveled surfaces intersect each other defining a third external knife edge where said first and said second beveled surfaces intersect each other;

each of said free ends of said cusps including an apex at the common intersection of said first beveled surface, said second beveled surface, and said corresponding ones of said circumferentially adjacent grooves that is located at a point positioned on a circumference of the head defined interiorly of the outer surface of the head and radially outwardly of said longitudinal axis;

each of said free ends of said cusps defining an interior knife edge extending from said nadir to its associated apex along an axis generally transverse to said longitudinal axis where corresponding ones of said circumferentially adjacent grooves intersect each other;

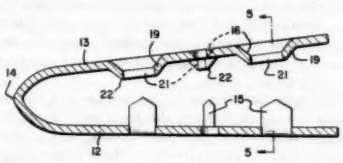
each of said first, second, and third knife edges terminating at the apex of a corresponding cusp.

4,560,224

FLAT CABLE TERMINATION

Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 339,557, Jan. 15, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,399
Int. Cl.[4] H01R *11/20*
U.S. Cl. 339—97 C 1 Claim



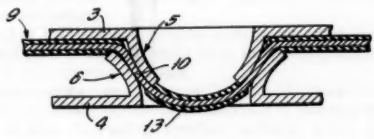
1. An electrical connection between a ribbon conductor and first and second metal plate portions of an electrical terminal in which a tab-like lance having parallel opposite edge portions upstanding from the first metal plate portion penetrates the ribbon conductor and is received in a socket provided in the second plate portion, the socket being defined by opposed lips pushed out of the plane of the second plate portion, the lips converging towards their free ends to define a slot-form lance-receiving mouth, a portion of the conductor having been drawn into the mouth by the lance and compressed between one lip only and one face only of the lance, the other face of the lance engaging the other opposed lip.

4,560,225

ELECTRICAL CONNECTOR FOR FLAT CABLES AND ASSEMBLY THEREOF WITH A FLAT CABLE

Giovanni Margaroli, Arese, and Mario Gandini, Milan, both of Italy, assignors to Servocavi S.p.A., Milan, Italy

Filed May 14, 1984, Ser. No. 610,107
Claims priority, application Italy, May 24, 1983, 21 240 A/83
Int. Cl.[4] H01R
U.S. Cl. 339—97 C 15 Claims



1. A connector for a flat cable having a conductor, said connector comprising:

a bendable metal plate, said plate being bendable along a bending line to provide a first arm portion and a second arm portion extending from said bending line;

a first radially deformable tubular member of metal extending from the surface of said first arm portion which faces

said second arm portion when said plate is bent, said first tubular member being disposed with its longitudinal axis substantially perpendicular to the plane of said surface and said first tubular member having a distal end surface which is engageable with said conductor with bending of said plate and having a wall thickness such that at least said distal end thereof is radially deformable inwardly upon engagement with said conductor and bending of said plate; and

a second radially deformable tubular member of metal extending from the surface of said second arm portion which faces said first arm portion when said plate is bent, said second tubular member being disposed with its longitudinal axis substantially perpendicular to the plane of said surface of said second arm portion, said second tubular member having a bore of a size which is greater than the exterior size of said first tubular member by at least ¼ the thickness of said conductor and being disposed on said second arm portion to receive said first tubular member in said bore with the wall of said bore spaced radially from the exterior surface of said first tubular member when said plate is bent and said second tubular member having a distal end which is engageable with said conductor with bending of said plate and having a wall thickness such that at least said distal end thereof is radially deformable outwardly upon engagement with said conductor and bending of said plate;

whereby by bending said plate and causing said arm portions to move toward each other, the distal ends of said first and second tubular members engage said conductor and deform inwardly and outwardly, respectively, without penetrating through said conductor and the distal end of said first tubular member enters into said bore of said second tubular member.

4,560,226

ELECTRICAL CONNECTOR MEMBER AND CONTACTOR UNIT

Alan J. Dennis, Nottingham, United Kingdom, assignor to TRW Inc., Redondo Beach, Calif.

PCT No. PCT/GB82/00191, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983

PCT Filed Jun. 29, 1982, Ser. No. 465,866

Claims priority, application United Kingdom, Jun. 30, 1981, 8120108

Int. Cl.⁴ H01R *4/24, 11/20, 13/502*

U.S. Cl. 339—99 R **17 Claims**

1. A contactor unit for an electrical connector, comprising a contactor portion having a coupling axis, a termination, and a flexible bridge portion joining said contactor portion and termination including a web having ends spaced along an axis generally parallel to and laterally spaced from said coupling axis, a first limb extending between and joined to said contactor portion and one end of said limb and a second arm extending between and joined to said termination and the other end of said web, and said bridge portion being flexible about said web to permit relative deflection of said contactor portion and termination laterally of said coupling axis.

4,560,227

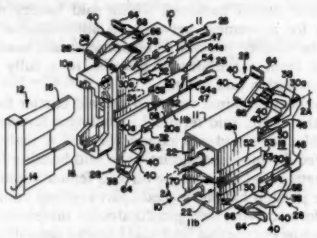
FUSEHOLDER FOR BLADE-TYPE FUSES

Alexander E. Bukala, Chicago, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Feb. 4, 1983, Ser. No. 464,046

Int. Cl.⁴ H01R *13/514*

U.S. Cl. 339—147 R **19 Claims**



1. A fuseholder unit adapted to be joined to other identical units at either lateral side thereof to form an elongated array of such units to be mounted in an elongated aperture in a mounting panel, each unit to house a fuse having spaced terminals, said fuseholder unit comprising an electrically insulating body forming a housing for insertion of a fuse from the front of said mounting panel, said body having passage means containing a pair of fuse terminal engaging contacts and communicating with a fuse insertion opening in the forward face of said housing to allow insertion of said fuse where said contacts engage with said terminals of the fuse, complementary fuseholder interconnecting means on the opposite lateral sides thereof for joining other identical fuseholder units thereto to form said array of units so that a closely fitting array of units of any desired length can be formed, mounting means for mounting said fuseholder body in said elongated panel aperture, said mounting means including resilient clip means integral with and projecting therefrom and which when compressed fit into said mounting panel aperture and spring out to make engagement with the opposite side of the panel when passed through said aperture, and said resilient clip means extending to the lateral side margins of the fuseholder unit body so that the clip means of adjacent units are in confronting contiguous relation.

4,560,228

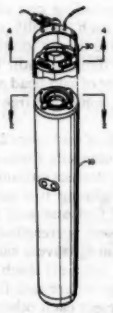
ELECTRICAL CONNECTOR FOR SONOBUOY LAUNCH SYSTEM

Roland Bender, Furlong, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 10, 1983, Ser. No. 503,010

Int. Cl.⁴ F41F *5/00*

U.S. Cl. 339—147 R **1 Claim**



1. A sonobuoy launching system for aircraft having an onboard, electrical, remote function selector, comprising:

a launch tube formed to be mounted on an aircraft, the breech end of said launch tube having a plurality of locking tabs disposed radially inward about its circumference and resilient electrical contacts radially spaced from the axis of said tube and formed to be operatively connected to the remote function selector; and

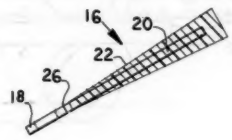
a sonobuoy container, the breech end of said container having a plurality of locking tabs disposed radially outward and rotatably engaging with said launch tube locking tabs, and having concentric conductive metal surfaces disposed on the breech end and aligned with and engaging respective ones of said contacts, said surfaces being formed to be electrically connected to the sonobuoy whereby the launch container can transfer a plurality of discrete electrical command signals to a sonobuoy from the function selector for programming the sonobuoy for a specific mission.

4,560,229

BATTERY POST EXTENSION MEMBER

Michael W. Benton, 2738 Roosevelt Blvd., #1101, Clearwater, Fla. 33520

Filed Sep. 24, 1984, Ser. No. 653,154
Int. Cl.[4] H01R *11/26*
U.S. Cl. 339—224 **8 Claims**



1. A safety device that extends the effective length of a side mounted or a top mounted battery post, said battery post of the type engageable by a cable clamp means, comprising,

a post extension member,

said post extension member hving a proximal end and a distal end,

said proximal end of said post extension member configured to define a battery post engaging means,

said battery post engaging means adapted to releasably engage said battery post,

said distal end of said post extension member configured to have an elongate, flat form,

said proximal end and said distal end of said post extension member meeting at a juncture line,

said juncture line being yieldable so that said distal end and said proximal end of said post extension member are positionable in differing angular positions relative to one another,

said proximal end of said post engaging member being disposed in underlying relation to said cable clamp when said device is in its operative position,

said distal end of said post engaging member being disposed substantially coplanar with said proximal end when said post engaging member is operatively installed on a battery having side mounted post members,

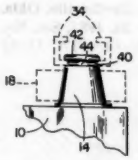
said distal end of said post engaging member being disposed substantially orthogonal to said proximal end when said post engaging member is operatively installed on a battery having top mounted post members.

4,560,230

BATTERY JUMP CABLE SYSTEM

Douglas R. Inglis, 4111 E. Packard Hwy., Charlotte, Mich. 48813

Filed Apr. 16, 1984, Ser. No. 600,576
Int. Cl.[4] H01R *11/26*
U.S. Cl. 339—224 **2 Claims**



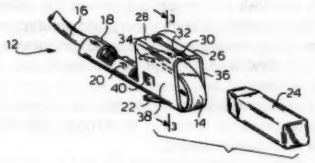
1. A battery jump cable connection system for rechargeable batteries comprising, in combination, a frusto-conical battery terminal of electrically conductive material having an axis, an inner maximum diameter region and an outer minimum diameter end, a circular extension defined on said outer end concentric to said axis and of a diameter no greater than the diameter of said outer end, said extension being homogeneously formed of the material of said terminal, and a circular recess defined in said extension concentric to said terminal axis and of such radial depth to receive and retain the jaws of a battery jump cable clamp therein.

4,560,231

ELECTRICAL CONNECTOR

Kazuo Shirai, Yokohama, Japan, assignor to Elco International K.K., Yokohama, Japan

Filed Mar. 10, 1983, Ser. No. 473,924
Int. Cl.[4] H01R *11/22, 13/11*
U.S. Cl. 339—258 RR **13 Claims**



11. An electrical contact comprising:

a longitudinal body for receiving a pin contact including first and second inwardly projecting and resiliently mounted tabs integral with said body, said tabs having edges in opposing relation and defining a longitudinal space between said edges;

a pair of contact points defined by each of said edges, each of said pairs of contact points being in opposing relation across said longitudinal space;

an elongate spring member secured to said body and extending longitudinally therein in the direction of insertion of a pin contact, said spring member including upper and lower surfaces thereof being in opposing relation to said first and second tabs;

a pair of spring member contact points extending upwardly from said spring member and defined by said side edges thereof, said spring member contact points being positioned longitudinally between said pairs of contact points defined by the edges of said tabs, said spring member contact points and said upper surface of said spring member defining, in section, a concave surface opposing said tabs;

said tab and spring member contact points being arranged to

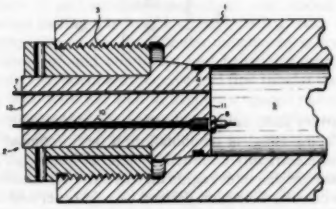
engage and center a pin contact upon its insertion within said body between said tabs and said spring member.

4,560,232

VESSEL WITH HIGH PRESSURE FEEDTHRU

Stephen G. O'Hara, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 24, 1982, Ser. No. 361,167
Int. Cl.[4] F17C *13/02*
U.S. Cl. 339—268 R **2 Claims**



1. Pressurizable vessel comprising
(a) housing wall means defining a chamber,
(b) a closure means for said housing wall means, said closure having a low pressure outside surface and a high pressure inside surface, said closure means having at least one opening therethrough for at least one connector means, and at least one additional opening therethrough for connection to a source of pressurizing fluid,
(c) connector means being separate from and non-integral with but attachable to and detachable from said closure at or through said inside surface, said connector means comprising
(aa) at least one conductor through said connector means to establish a connection between the chamber and an area outside of the chamber, said conductor being hermetically sealed in said connector means to prevent fluid flow through said connector means around said conductor,
(bb) sealing means for fluid tight, non-integral sealing of said connector means at or through said inside surface of said closure means,
(cc) holding means for holding said connector means in tight but non-integral connection with said closure means,
(d) an O-ring between the closure means and the inside of the housing wall means for a fluid tight, non-integral seal.

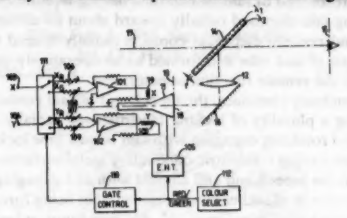
4,560,233

COLOR HEAD UP DISPLAY SYSTEM

John R. Banbury, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 6, 1984, Ser. No. 577,369
Claims priority, application United Kingdom, Feb. 9, 1983, 8303619
Int. Cl.[4] G02B *5/32*
U.S. Cl. 350—3.7 **11 Claims**

1. A head up display system including a light emissive object at an object plane, optics including a collimator and a combiner arranged to provide a collimated image of the object for viewing at an eye plane overlaid on a view through the combiner, the optics being arranged for optimum accuracy over a narrow band of wavelengths characterized in that the object emits light in at least two chromatically separated emission wavebands and by a diffractive optical element in the light path



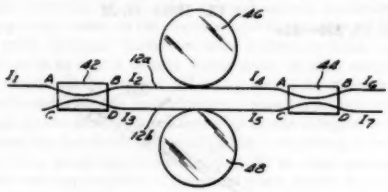
from object plane to eye plane having narrow band reflection characteristics at each emission waveband.

4,560,234

FIBER OPTIC SWITCHABLE COUPLER

Herbert J. Shaw, Stanford; Ralph A. Bergh, and Michel J. F. Digonnet, both of Palo Alto, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 15, 1983, Ser. No. 523,150
Int. Cl.[4] G02B *5/174*
U.S. Cl. 350—96.15 **17 Claims**



1. An optical switch for switching light from a light source, comprising:
first and second optical couplers, each comprising first and second optical fibers relatively positioned to provide partial light coupling therebetween, said first and second optical fibers of said first coupler being optically connected, respectively, to said first and second optical fibers of said second coupler by first and second intermediate fiber optic segments; and
means for varying the optical path length in said first intermediate fiber optic segment to introduce a variable phase shift to light transmitted between said first optical fiber of said first optical coupler and said first optical fiber of said second optical coupler.

4,560,235

FIBER OPTIC CONDENSER FOR AN OPTICAL IMAGING SYSTEM

Donald A. Servaes, Burlington, and George O. Reynolds, Waban, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

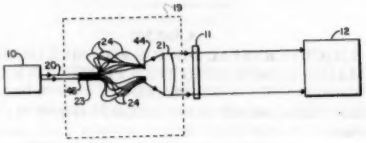
Filed Sep. 22, 1982, Ser. No. 421,687
Int. Cl.[4] G02B *5/17*
U.S. Cl. 350—96.24 **6 Claims**

1. A fiber optic condenser system which provides a plurality of sources of visible light, each of which includes substantially coherent light, said sources substantially incoherent to each other, such that when said condenser system is used in combination with an optical imaging system, an image with increased contrast and resolution is provided, such condenser system comprising:

A. a source of substantially coherent visible light

B. a condenser lens for providing substantially uniform illumination at the image plane of said optical imaging system;

C. a plurality of optically transmitting fibers forming a fiber optic bundle in which the length of all said optic fibers are randomized such that the difference in length between said fibers is greater than the coherence length of said source of visible light, and the length of each said fiber within said bundle is not the same as the coherence length of any other one of said fibers;



D. wherein said bundle is shaped such that one end of said bundle terminates in a substantially planar surface whose cross-sectional area substantially matches the cross-sectional area of the output beam of said source of visible light;

E. wherein the other end of said bundle is shaped to form an annulus with a substantially planar end; and

F. wherein the inner and outer diameters of said annular end are selected such that light projected from said source of visible light through said fiber optic bundle is collected by said condenser lens and imaged on said optical imaging system.

4,560,236

COLOR VARYING REFLECTOR

Ronald A. W. Clarke, 501 Wilkins St., #717, London, Ontario, Canada N6C 5G2

Filed Jan. 12, 1984, Ser. No. 570,191

Claims priority, application Canada, Jan. 12, 1983, 419300

Int. Cl.[4] G42B *5/48*

U.S. Cl. 350—102 **8 Claims**

1. A reflector element comprising first and second reflective surfaces facing each other equidistant from and parallel to an imaginary center plane, and a third reflective surface adjacent to and abutting perpendicularly said first and second reflective surfaces, in which at least one reflective surface is tinted on one side of the center plane.

4,560,237

LENS DRIVING APPARATUS IN CAMERAS

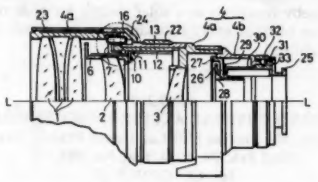
Zenichi Ohkura, Ichikawashi, and Shinsuke Kohmoto, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,378

Claims priority, application Japan, Jun. 7, 1982, 57-84235[U]

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—255 **7 Claims**



1. In an optical lens system having a stationary lens barrel and at least two groups of lenses having a same optical axis, of which the first group of lenses have a stationary lens assembly supported by the stationary lens barrel, and the second group of lenses have at least one movable focusing lens, wherein an apparatus for moving the movable focusing lens comprises a helicoid ring which is provided coaxially within the stationary lens barrel for rotation to cause the movable focusing lens to move along the optical axis and which is provided with a first gear, a focusing actuation ring which is coaxially and rotatably provided on the outer periphery of the stationary lens barrel and which is provided with a second gear, and a gear means which is rotatably supported by the stationary lens barrel and which comes into engagement with the first gear and the second gear to transmit the rotational movement of the focusing actuation ring to the helicoid ring.

4,560,238

LIGHT TRANSMISSION CONTROL APPARATUS

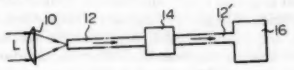
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

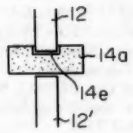
Filed Dec. 27, 1982, Ser. No. 452,978

Claims priority, application Japan, Jan. 9, 1982, 57-2155

Int. Cl.[4] G02B *26/02*

U.S. Cl. 350—266 **5 Claims**





1. A solar switch for controlling the transmission of solar energy to the location where the transmitted solar energy is utilized, comprising converging means for converging the sunlight into light having a high energy density, a first optical cable into which the sunlight is converged by said converging means, said first cable having an end face, a second optical cable having an end face, said two end faces being spaced from one another at a predetermined spacing, said first and second

cables defining an optical path for introducing and passing therethrough said converged light of high energy density, a light interceptor means comprising isotropic graphite disposed in a plane perpendicular to said optical path and movable between a first position within said space between said first and second end faces for blocking said optical path and a second position removed from said space for unblocking said optical path, said light interceptor means having a channel, at least one of said end faces being disposed within said channel to thereby prevent leakage of light when the solar switch is in said first position blocking said path, whereby said light interceptor means thereby functions as a solar switch for controlling the transmission of solar energy to said location where the solar energy is utilized.

4,560,239

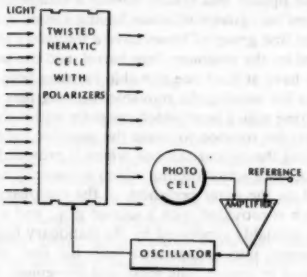
LIQUID CRYSTAL ACTIVE LIGHT SHIELD

Amnon Katz, 401 Forrest Hill La., Grand Prairie, Tex. 75051

Filed Feb. 29, 1984, Ser. No. 584,772

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—331 R **2 Claims**



1. In protective eyewear or transparent light shielding subject to varying intensity of incident light, apparatus comprising the combination of

a layer of liquid crystal contained between two transparent electrodes and between two plane polarizers,

a photocell which is placed behind said eyewear or shielding and measures only transmitted light, electronic circuitry to process the output of such photocell and produce a signal into said electrodes so as to reduce the transmission coefficient of lght through the combination of said polarziers and liquid crystal in proportion to the intensity of light incident thereon, and wherein the deviation of the signal produced by the photocell from a reference level is used as a negative feedback to maintain a constant intensity of transmitted light."

4,560,240

LIQUID CRYSTAL DEVICE WITH ANTI-REFLECTION FUNCTION IN ELECTRODE

Nobuyuki Sekimura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 435,955

Claims priority, application Japan, Oct. 30, 1981, 56-175116; Oct. 30, 1981, 56-175117

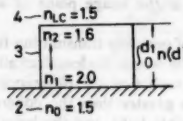
Int. Cl.⁴ G02F *1/13, 1/135*

U.S. Cl. 350—336 **4 Claims**

1. A liquid crystal device with an anti-reflection function comprising:

a liquid crystal; and

two electrode-substrates so positioned as to sandwich said liquid crystal therebetween, at least one of said electrode-substrates including a transparent substrate and a transparent electrode provided thereon and facing said liquid crystal, said transparent electrode comprising a single layer and having a refractive index which decreases in the direction of thickness thereof from the side of said transparent substrate to the side of said liquid crystal to reduce



the light in the visible wavelength range to be reflected at the surface thereof.

4,560,241

LIQUID CRYSTAL DEVICE FOR MULTICOLOR IMAGES COMPRISING THIN PROTECTIVE GLASS PLATE

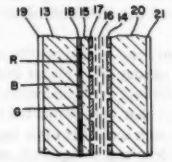
Michael Stolov, and Adi Stolov, both of 25 Hapoel St., Nof Yam, Israel

Filed Nov. 16, 1983, Ser. No. 552,378

Claims priority, application Israel, Nov. 2, 1983, 70116

Int. Cl.⁴ G02F *1/13, 1/137*

U.S. Cl. 350—339 R **11 Claims**



1. A multicolor liquid crystal display comprising an integrated multilayer arrangement, the sequence of layers being: a thick transparent glass or plastic plate, color filter pattern filter means, a thin glass plate, a liquid crystal layer, and a second thick plate of glass, said thin glass plate and said second thick glass plate each having a surface which faces the liquid crystal layer with each surface having applied thereto a transparent electrode pattern which corresponds to the color filter pattern and wherein said color filter pattern filter means is located between said thick transparent glass or plastic plate and said thin glass plate to protect the color filter pattern filter means from said liquid crystal.

4,560,242

VARIABLE MAGNIFICATION OPTICAL SYSTEM

Mitsuhiro Tokuhara, Chigasaki, and Yu Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 311,446, Oct. 14, 1981, abandoned. This application May 4, 1984, Ser. No. 606,858

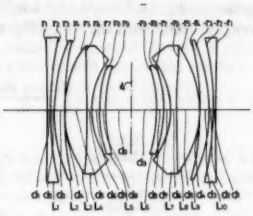
Claims priority, application Japan, Oct. 15, 1980, 55-144804

Int. Cl.⁴ G02B *15/16, 17/00*

U.S. Cl. 350—425 **21 Claims**

1. A variable magnification optical system comprising, in sequence from the object to the image side, a first single negative lens, a second positive lens, a third negative lens, a fourth positive lens, a diaphragm, a fifth positive lens, a sixth negative lens, a seventh positive lens and an eighth single negative lens, said first and eighth single negative lenses being disposed symmetrically with respect to the diaphragm, each of said fourth and fifth positive lenses being in the form of a meniscus lens having a concave surface facing the diaphragm, each of said third and sixth negative lenses being in the form of a lens having a concave surface facing said diaphragm, each of said second and seventh positive lenses being in the form of a lens having a surface opposite from said diaphragm which is con-

cave with respect to said diaphragm, said second, third and fourth lenses forming a first positive lens group, said fifth, sixth and seventh lenses forming a second positive lens group, said



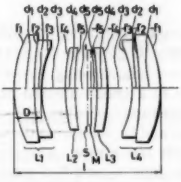
first and second positive lens groups being movable symmetrically relative to said diaphragm with said first and eight single negative lenses fixed relative to said diaphragm so that the focal length of said optical system may be changed.

4,560,243

PROJECTION LENS

Hidenori Terasawa, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,696
Claims priority, application Japan, Jun. 30, 1983, 58-119420
Int. Cl.[4] G02B *9/58*
U.S. Cl. 350—469 **17 Claims**



1. A symmetrical type lens assembly comprising first lens means including a positive lens located at the object side and a negative lens located at the image side and cemented to the positive lens, said first lens means being in the form of a meniscus lens having its convex face located at the object side and having a total focal length which is negative; second lens means in the form of a positive meniscus lens having its convex face located at the object side; a stop; third lens means in the form of a positive meniscus lens having its convex face located at the image side; and fourth lens means including a negative lens located at the object side and a positive lens located at the image side and cemented to the negative lens, said fourth lens means being in the form of a meniscus lens having its convex face located at the image side and having a total focal length which is negative; said first and second lens means being substantially symmetrically arranged relative to said fourth and third lens means about said stop, said first, second, third and fourth lens means being arranged in the described order starting from the object side; further said symmetrical type lens assembly being adapted to fulfill the following conditions:

$$0.12f<l<0.21f$$

$$0.14f<r4<0.22f$$

where

f: the total focal length of the lens system;

l: the entire length of the lens system; and

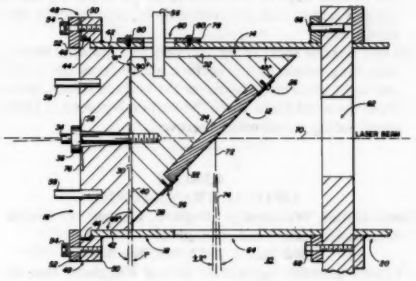
r4: the radius of curvature of the second lens means at the face thereof remote from the stop.

4,560,244

APPARATUS AND METHOD FOR REDIRECTING AN INCIDENT BEAM

Charles B. Ackerman, Paradise Valley, Ariz., assignor to Solavolt International, Houston, Tex.

Filed Jun. 25, 1984, Ser. No. 623,891
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—486 **17 Claims**



1. An apparatus for redirecting an incident beam to a point located obliquely therefrom comprising:

a reflective surface for interception of said incident beam, said reflective surface providing a reflected beam therefrom;

a mounting block having a mounting face and an angularly disposed transverse surface thereof, said mounting face for retention of said reflective surface;

a wobble plate having a beveled surface thereof rotatably secured to said transverse surface of said mounting block; and

a housing for rotatable retention of said wobble plate, said housing having respective apertures for receipt and transmission of said incident and reflected beams;

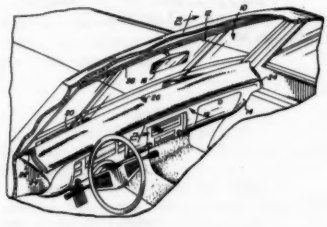
whereby said reflected beam may be deflected longitudinally by rotation of said wobble plate with respect to said mounting block and transversely to said obliquely located point by rotation of said wobble plate and said mounting block with respect to said housing.

4,560,245

VEHICULAR WINDSHIELD CURTAIN FOR INHIBITING HEAT TRANSFER

Patricia I. Sarver, P.O. Box 6182, Phoenix, Ariz. 85005

Filed Mar. 2, 1984, Ser. No. 585,399
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—95 C **7 Claims**



1. A curtain for inhibiting heat transfer through the windshield into the interior of a vehicle comprising:

(a) a curtain for demountable placement in juxtaposed coextending relationship with the interior surface of the windshield, said curtain being formed of a flexible and foldable sheet of light impervious material which is configured to

substantially match the shape of the windshield and having top and bottom edges;

(b) cooperating elements of a demountable top edge fastener means on the top edge of said curtain and for affixation proximate the top edge of the windshield for demountably attaching the top edge of said curtain proximate the top edge of the windshield;

(c) cooperating elements of a bottom edge fastener means on the bottom edge of said curtain and for affixation proximate the bottom edge of the windshield for attaching the bottom edge of said curtain proximate the bottom edge of the windshield; and

(d) said flexible sheet of light impervious material having light reflecting means on the surface which faces the windshield, and light absorbing means on the surface which faces away from the windshield when the curtain is placed in juxtaposed coextending relationship therewith.

4,560,246

OPTICAL TRANSMISSION

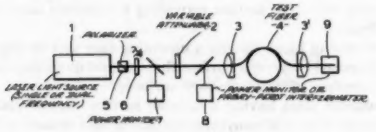
David Cotter, Woodbridge, England, assignor to British Telecommunications, London, England

Filed Jun. 2, 1983, Ser. No. 500,436

Claims priority, application United Kingdom, Jun. 4, 1982, 8216307

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 350—96.16 **37 Claims**



26. An optical transmission system comprising: an optical fibre having a natural stimulated Brillouin scattering power threshold for a given linewidth light,

light generating means to generate light of predetermined linewidth and at a power above the natural Stimulated Brillouin Scattering power threshold for the fibre at that linewidth,

means to launch said generated light into the fibre at said excess power level, and

means for introducing recurrent phase deviations in the transmitted light at a rate which is sufficiently high to substantially suppress Stimulated Brillouin Scattering.

4,560,247

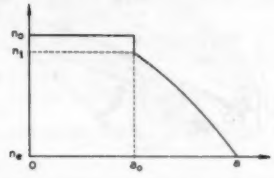
LARGE BANDWIDTH OPTICAL FIBERS

Pierre Aldebert, Vanves, France, assignor to Quartz et Silice, France

Filed Jul. 1, 1983, Ser. No. 510,188

Int. Cl.⁴ G02B *5/172*

U.S. Cl. 350—96.30 **11 Claims**



1. An optical fiber comprising a core of silica glass with radius a_0 and constant index of refraction n_0 surrounded by a doped silica glass cladding with outer radius a, in which the index of refraction varies continuously from a value n_1 at an interface between the core and the cladding to a value n_e at the periphery of the cladding n_e being less than n_1 and n_1 being less than n_0 wherein there is a step change in the index of refraction at the interface between the core and the cladding and a measure of this step change, $E_o=(n_o^2-n_1^2)/(n_o^2-n_e^2)$, is related to the ratio a_o/a in accordance with the following relation:

$$\frac{\pi}{x_o} = \frac{\pi}{2} + \arcsin(2E_o - 1) + 2\left(\frac{1-E_o}{E_o}\right)^{\frac{1}{2}}$$

where $x_o=a_o/a$ and x_o is less than 0.83.

4,560,248

FIBRE OPTIC SENSOR WITH BONDED DYE

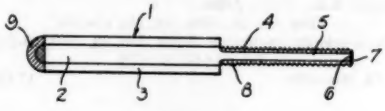
John H. W. Cramp, St. Helens; Robert T. Murray, Helsby; Robert F. Reid, Highworth, and Roy M. Mortier, Whitefield, all of England, assignors to Imperial Chemical Industries, PLC, London, England

Filed Aug. 9, 1982, Ser. No. 406,521

Claims priority, application United Kingdom, Aug. 14, 1981, 8124939

Int. Cl.⁴ G02B *6/00, 6/14*

U.S. Cl. 350—96.34 **10 Claims**



1. An optical sensor comprising an optical fibre core and a sensitive chromophore chemically bonded to the surface of the said core, the chromophore being variable in colour, in response to changes in a predetermined chemical or physical parameter, in combination with fibre optic means for launching light into the sensor and for collecting the light after it has been transmitted through the sensor; whereby on being passed through the sensor, light is modified according to the colour response of the chromophore to the parameter to which the chromophore is sensitive.

4,560,249

METHOD OF FORMING DIFFRACTION GRATINGS AND OPTICAL BRANCHING FILTER ELEMENTS PRODUCED THEREBY

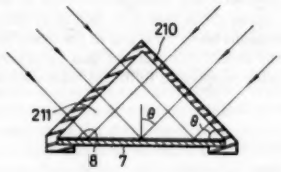
Yoshikazu Nishiwaki; Shunji Matsuoka, and Kenji Okamoto, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1983, Ser. No. 486,171

Claims priority, application Japan, Apr. 16, 1982, 57-63313; Apr. 20, 1982, 57-66585; Apr. 30, 1982, 57-72713

Int. Cl.⁴ G02B *5/18*

U.S. Cl. 350—162.17 **8 Claims**



1. In a method for forming a diffraction grating by a holographic exposure process which includes the steps of splitting

a laser beam into two collimated light beams having an increased beam radius and reflecting said beams onto a substrate coated with light sensitive material, the improvement comprising placing a photomask having a transparent area on said light sensitive material at a location corresponding to the desired location of a diffraction grating and passing one of said beams through an intermediate mask having a narrow opening to limit the light flux of said one of said beams to the area where the diffraction grating is to be formed.

4,560,250

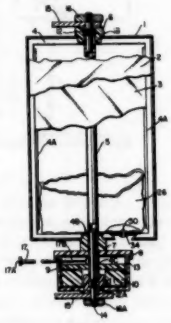
EXPLOSION-PROOF AND FOG-FREE DAY AND NIGHT OUTSIDE REAR VIEW MIRROR INCORPORATING VARIABLE POSITION ACTUATOR

Carl D. Russell, P.O. Box 334, Sallisaw, Okla. 74955

Filed Sep. 3, 1982, Ser. No. 414,920

Int. Cl.⁴ G02B *17/00*

U.S. Cl. 350—279 **2 Claims**



1. A day and night outside vehicular rear view mirror comprising in combination:

a housing for the mirror;

a glass closing the housing from the atmosphere with dry vapors therein with said mirror contained within the housing and fixed at one end thereof at an acute angle of approximately 13° to the glass;

a frame for attachment to a vehicle to support said housing for pivotal motion relative thereto;

means actuable from the interior of the vehicle for pivotally changing the housing position relative to the vehicle operators viewing direction for bright day viewing or dim night viewing; and,

a vapor-proof expandable-collapsible sealed bag within the housing and having an opening in communication with the atmosphere whereby expansion of the dry vapors in the housing causes the bag to expel atmospheric gases into the atmosphere and contraction of the dry vapors in the housing causes entry of atmospheric gases into the bag thereby avoiding rupture of the mirror housing due to atmospheric pressure changes.

4,560,251

ANTIGLARE SHIELD FOR EXTERIOR MIRRORS

Waldemar Mürjahn, Velbert, Fed. Rep. of Germany, assignor to Mignon-Media GmbH, Mettman, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,966

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 8334768[U]

Int. Cl.⁴ B60J *3/00*

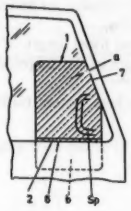
U.S. Cl. 350—283 **6 Claims**

1. An antiglare shield for exterior rear view mirrors on motor vehicles, said shield comprising:

an antiglare sheet composed of a substantially transparent plastic material and being composed of:

a support section operable to be inserted inside of a vehicle window shaft, and

an exposed antiglare section operable to extend along a side window surface of a motor vehicle and corresponding in size at least to the size of an area covering a reflected field of vision of an operator of the motor vehicle from an enterior rear view mirror; and



stop mean connected to said antiglare sheet for limiting the extent of insertion of the support section inside the vehicle window shaft.

4,560,252

OPTICAL FILTER DEVICE

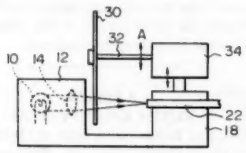
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,910

Claims priority, application Japan, Feb. 10, 1983, 58-21042; Feb. 14, 1983, 58-22572

Int. Cl.⁴ G02B *5/20, 27/10*

U.S. Cl. 350—315 **5 Claims**



1. An optical filter device for filtering optical energy having a high energy density which propagates along a predetermined optical path, comprising:

a rotatable optical filter located to constantly intersect the optical path at a part thereof, an axis of rotation of the optical filter being movable perpendicularly to said axis of rotation;

drive means for rotating said optical filter;

whereby the optical energy becomes incident on the part of the optical filter which changes every moment due to rotation of the optical filter.

4,560,253

ZOOM LENS SYSTEM

Shuji Ogino, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1983, Ser. No. 538,987

Claims priority, application Japan, Oct. 5, 1982, 57-175692

Int. Cl.⁴ G02B *13/18, 15/14*

U.S. Cl. 350—426 **9 Claims**

1. A zoom lens system of an inverted telephoto type comprising, from the object side to the image side;

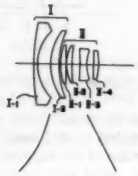
a first lens group of a negative refractive power consisting of, from the object side to the image side, a first negative component, and a second positive component of a positive

meniscus lens convex to the object side, at least one of the refractive surfaces in the first lens group being aspheric;

a second lens group of a positive refractive power with a variable air space formed between the first and second lens groups, consisting of from the object side to the image side, a third positive component, a fourth positive component, a fifth negative component, and a sixth positive component, the variable air space being varied during a zooming operation;

wherein the shortest focal length of the zoom lens system is less than the length of the diagonal line of the image plane; and

wherein the zoom lens system fulfills the following conditions:



$$2.3f_S < l < 2.75f_S$$

$$0.55f_S < \gamma_3 < 1.8f_S$$

wherein:

l represents the axial distance from the object side surface of the first component to the image plane of the whole lens system in the longest focal length condition;

γ_3 represents the radius of curvature of the object side surface of the second component; and

fs represents the focal length of the whole lens system in the shortest focal length condition.

4,560,254

ZOOM LENS SYSTEM

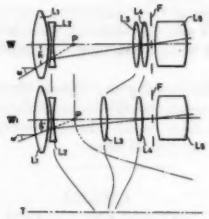
Yoshikazu Doi, and Kenzo Sado, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed May 14, 1984, Ser. No. 610,167

Claims priority, application Japan, May 18, 1983, 58-87142

Int. Cl.⁴ G02B *9/64, 15/22*

U.S. Cl. 350—427 **1 Claim**



1. A zoom lens system comprising: a convergent lens group fixed during zooming; movable lens groups for zooming; and an image-forming lens group, wherein

said movable lens groups comprise three groups including: a first movable divergent lens group; a second movable convergent lens group; and a third movable convergent lens group, as arranged in the forward order, and

an interval between said second movable convergent lens group and said third movable convergent lens group is varied to be widened on the wide angle side, whereby the movement value of said first movable divergent lens group is decreased.

4,560,255

ENLARGING AND READING APPARATUS

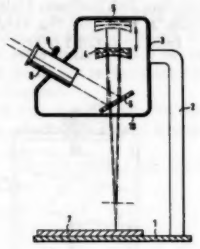
Josef Reiner, Rodenkirchen, Fed. Rep. of Germany, assignor to Oculus Optikgeraete GmbH, Dutenhofen, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,911

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217939

Int. Cl.⁴ G02B *17/08, 21/14, 27/02*

U.S. Cl. 350—503 **9 Claims**



1. In an enlarging apparatus adapted to help a visually impaired person read, including a concave mirror having an optical axis and having a focal point on said optical axis at a location spaced from said concave mirror, and a semitransparent mirror which is inclined relative to said optical axis of said concave mirror, the improvement comprising wherein said optical axis of said concave mirror intersects said semitransparent mirror, said semitransparent mirror being located between said concave mirror and said focal point thereof; including telescope means through which a reflection from said semitransparent mirror of an object which is to be viewed can be observed at infinity; and wherein the distance of said concave mirror from said object can be adjusted.

4,560,256

SEGMENTED MIRROR

C. James Blom, Bakersfield, Calif., assignor to Roxor Corporation, Bakersfield, Calif.

Continuation of Ser. No. 385,544, Jun. 7, 1982, Pat. No. 4,470,665, which is a continuation-in-part of Ser. No. 233,106, Feb. 10, 1981, Pat. No. 4,368,951, which is a continuation-in-part of Ser. No. 109,970, Jan. 7, 1980, abandoned. This application Feb. 9, 1984, Ser. No. 578,688

The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.

Int. Cl.⁴ G02B *5/08*

U.S. Cl. 350—613 **26 Claims**

1. In a mirror, the combination comprising:

(a) a support,

(b) a myriad of surfaces carried by the support, certain of said surfaces dimensionally offset from one another in a common direction generally parallel to the general direction of incident radiation to be reflected, said surfaces being radiation reflecting surfaces each oriented in such a

way that as a group they collectively reflect radiation essentially as if they were a continuous reflecting surface,

(c) each of said surfaces having a periphery comprising an irregular series of line segments which are connected and curved, the peripheries of said surfaces, when projected in said common offset direction onto a plane perpendicular thereto, contiguously conforming to one another.

4,560,257

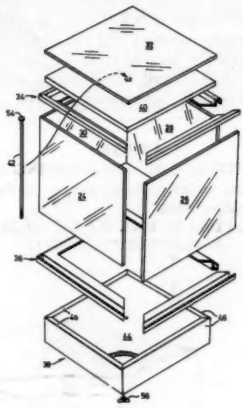
KNOCK-DOWN GEOMETRIC STRUCTURE WITH OPTIONAL MIRRORED FACES

Martin Otema, 51 Pine Ridge Dr., Scarborough, Ontario, Canada M1M 2X6

Filed Sep. 30, 1982, Ser. No. 431,529

Int. Cl.[4] **G02B** *5/08, 7/18;* **B65D** *85/00, 8/14, 6/00;* **A47B** *95/00, 48/00, 87/00, 67/00;* **A47F** *7/14;* **A47G** *1/16, 1/00;* **B60R** *1/02*

U.S. Cl. 350—616 **7 Claims**



1. A mirror cube having upper and lower ends and four rectangular side faces disposed substantially at right angles with respect to one another, the structure comprising four rectangular mirror panels respectively defining said side faces, upper and lower frame elements extending respectively around upper and lower marginal portions of said mirror panels and embracing and being retained on said marginal portion of the panels, said frames being decoratively finished, a top mirror panel supported by said top frame substantially even with said frame, and a base co-operating with said frame at the lower end of the structure and supporting said mirror panels.

4,560,258

SPECTACLES WITH EXTRACTABLE TEMPLES

Smith B. Stanley, Brooklyn, and Yoram A. Alroy, New York, both of N.Y., assignors to Alroy & Stanley Associates, Inc., New York, N.Y.

Filed Aug. 24, 1983, Ser. No. 526,116

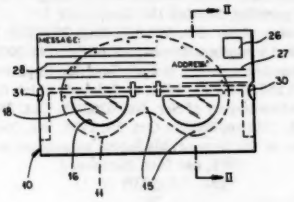
Int. Cl.[4] **G02C** *5/20, 9/02, 5/14*

U.S. Cl. 351—115 **11 Claims**

1. A pair of spectacles comprising:

a frame having a pair of lens-receiving portions rigidly interconnected by a bridgepiece, said frame being provided with a channel extending across said portions and said bridgepiece; and

a pair of temples mounted on said frame, at least one of said temples being slidably received in said channel, and being of a length received in said channel so as to be withdrawn therefrom upon extension from said channel, and having a shank which is extractable from said channel and swingable into a position wherein said one of said temples lies



generally transversely to a plane of said frame and said channel.

4,560,259

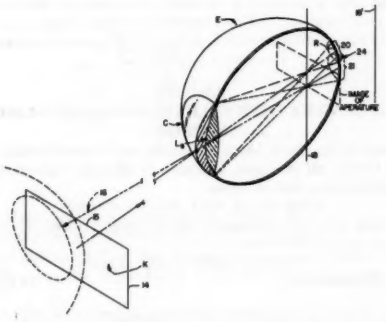
OBJECTIVE REFRACTOR FOR THE EYE

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Continuation of Ser. No. 202,536, Oct. 31, 1980, abandoned. This application Jul. 23, 1984, Ser. No. 633,079

Int. Cl.[4] **A61B** *3/10*

U.S. Cl. 351—211 **40 Claims**



1. An apparatus for testing the eye comprising in combination: an illuminated light source having a boundary terminating along a straight line to produce a knife edge terminator; means for projecting an image of said light source proximate said knife edge terminator to an eye for producing in said eye the illumination of a retinal plane; means for detecting the illumination of said eye including a photodetector; and means intermediate said light source and photodetector comprising an optic for the deflection of light incident thereon to differing destinations having an optical surface equivalent to a plurality of side-by-side optical elements, each of said optical elements having means for dispersing light incident thereon over an area of dispersion whereby when light is incident upon said optic over said plurality of optic elements said light is dispersed from said optic in a weighted pattern at said photodetector.

4,560,260

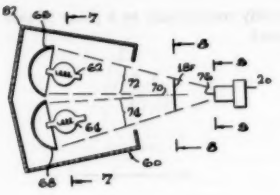
MOTION PICTURE SYSTEM

Douglas Trumbull, Santa Monica, Calif., assignor to Showscan Film Corporation, Marina Del Ray, Calif.

Continuation of Ser. No. 412,040, Aug. 26, 1982, Pat. No. 4,477,160, and a continuation-in-part of Ser. No. 885,901, Mar. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 713,658, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 626,965, Oct. 29, 1975, abandoned. This application Oct. 10, 1984, Ser. No. 659,266 The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] G03B *21/32*

U.S. Cl. 352—40 **4 Claims**



1. A method for producing a motion picture image that creates a vivid impression of realism in observers comprising:

exposing a strip of light sensitive film through a camera lens to form images on individual film frames spaced along the length of the film, at a predetermined constant frame rate; and

projecting said film strip onto a screen, while advancing said strip at the same frame rate as the one at which the film was exposed;

said step of exposing and projecting including creating images on said film having a resolution of more than 40 line pairs per milimeter and a frame area of at least 0.36 square inch;

said step of projecting includes producing an illumination level of at least 15 foot lamberts on said screen; and

said constant frame rate is at least 50 frames per second.

4,560,261

FLAT CAMERA WITH SELF PHOTOGRAPH FRAMING MIRROR

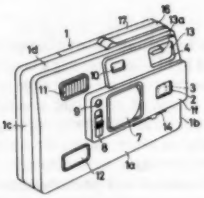
Hiroshi Ueda, Nara; Akira Yoshizaki, and Yasuo Masaki, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1983, Ser. No. 491,846

Claims priority, application Japan, May 7, 1982, 57-77063; Oct. 1, 1982, 57-173764

Int. Cl.[4] G03B *13/02, 13/14*

U.S. Cl. 354—121 **16 Claims**



1. A flat camera comprising:

a generally parallelepiped flat housing which is thin in the forward and rearward direction and which has a cartridge chamber adapted to receive a disk film cartridge, a front, a rear, a top, a bottom and first and second laterally spaced sides;

a lens window approximately vertically medially located on said housing front side proximate said first side;

a primary taking lens disposed behind said lens window;

a movable framing mirror approximately centrally located on housing front, laterally proximate to said lens window and having a reflector surface for enabling observation of an object from the front of said camera;

a close-up taking lens supported for movement between a close-up photography position where it is in optical registry with said primary taking lens and a normal photography position where it is retraced from optical registry with said primary taking lens; and

means for moving said framing mirror to alter the inclination thereof with respect to the optical axis of said primary taking lens in accordance with the movement of said close-up taking lens between said close-up photograph position and said normal photography position to minimize parallax on said framing miror reflector surface between the condition where said framing mirror is viewed from a close-up photography distance position in front of said camera with said close-up lens in said close-up photography position and the condition where said framing mirror is viewed from a normal photography distance position in front of said camera with said close-up lens in said normal photography position.

4,560,262

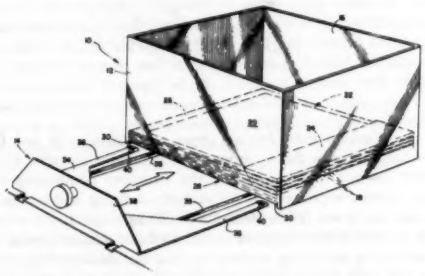
FILM UNIT STORAGE AND DISPENSING APPARATUS

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,263

Int. Cl.[4] G03B *17/26, 17/52*

U.S. Cl. 354—180 **5 Claims**



1. Apparatus for storing a plurality of film units of the self-developing type and for successively dispensing each of said units to a photographic station, said film units comprising a flexible unit having a rupturable pod of processing fluid extending adjacent a leading margin of the film unit for subsequent advancement of its contained processing fluid across said film unit from the area of said leading margin to a trailing margin, wherein said film unit includes a processing fluid trap extending along said trailing margin of said film unit for capturing excess fluid, said trap stiffening said trailing margin, said pod stiffening said leading margin of said film unit, said apparatus comprising:

a housing configured for receiving a stack of film units in overlying relation to each other;

an opening located in said housing in adjoining operative relation to one film unit of said stack, said opening extending along a first side margin of said film unit;

means for advancing said one film unit from said stack, said means including a pick arrangement configured to engage a second side margin of said one film unit opposite said first side margin and advance said one film unit through said opening, said pick arrangement including at least a

pair of spaced-apart pick arms being movable between a first position to a second position, wherein when said pick arms are at said first position they cooperate with the bottom stacked film unit, and wherein when said pick arms are transported to said second position the bottom film unit is carried therewith outside said housing; and,

said pick arms being spaced apart by a predetermined distance so that each imparts a force acting on said bottom unit, which is generally coincidental with respective ones of said pod and said trap, when said arms move from said first position to said second position; and

said housing and film unit stack being configured and arranged for successively placing another film unit in a location operatively adjoining said opening following advancement of each film unit from said housing.

4,560,263

DRIVE SYSTEM FOR A VIBRATION WAVE MOTOR FOR LENS CONTROL

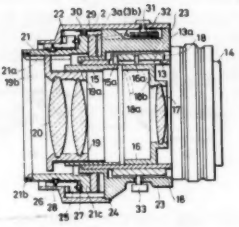
Makoto Katsuma, Kawasaki; Hiroyasu Murakami, Tokyo, and Akira Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,634

Claims priority, application Japan, Dec. 3, 1982, 57-211284; Dec. 9, 1982, 57-216000; Dec. 13, 1982, 57-218025

Int. Cl.[4] G03B *3/00;* H01L *41/08*

U.S. Cl. 354—195.1 **23 Claims**



21. A lens drive apparatus comprising:

(a) a vibration member including electro-mechanical energy conversion elements for generating a wave by the vibration generated in said elements;

(b) a driven member contacted with said vibration member, the relative position of said driven member to that of said vibration wave being changed;

(c) control means for applying a periodic signal to said electro-mechanical energy conversion elements, said control means having a first state in which said wave is generated so as to cause said wave to change said relative position, and a second state in which said wave is generated so as to cause said wave not to change said relative position; and

(d) means for operating either said first or second state of said control means.

4,560,264

DEVICE FOR DISPLAYING DATA IN CAMERA VIEWFINDER

Toshiyuki Kitazawa; Tahei Morisawa, and Norimichi Takahashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 575,375

Claims priority, application Japan, Jan. 29, 1983, 58-11449[U]

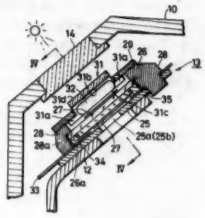
Int. Cl.[4] G03B *13/02, 17/20*

U.S. Cl. 354—219 **7 Claims**

1. A device for simultaneously and uniformly illuminating a plurality of dispaly elements in a camera comprising:

an illuminating lamp, and

a light transmitting diffusion plate means for diffusing light from said illuminating lamp and transmitting said diffused light with equal intensity to said plurality of display elements, said diffusion plate means including an opening for receiving and retaining said illuminating lamp, first and second diffusion reflection surfaces sloping downwardly from an apex at a predetermined slope, and a flat surface facing said plurality of display elements for transmitting



diffused light from said first and second diffusion reflection surfaces to said plurality of display elements, said lamp retaining opening being positioned in line with said apex, said predetermined slope being selected so that light from said illuminating lamp is reflected with equal intensity from the interior faces of said first and second reflection surfaces.

4,560,265

BLADE TYPE FOCAL PLANE SHUTTER

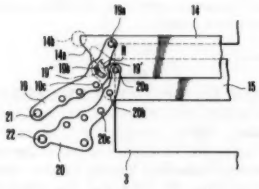
Teiji Hashimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1984, Ser. No. 569,783

Claims priority, application Japan, Jan. 25, 1983, 58-7892[U]

Int. Cl.[4] G03B *9/40*

U.S. Cl. 354—246 **2 Claims**



1. A blade type focal plane shutter, comprising:

a shutter base plate having an exposure window;

a slit forming blade and a plurality of auxiliary blades for light shielding, respectively made of opaque thin plates; and

a first operating arm and a second operating arm which can rotate around shafts provided at one side of the exposure window in the shutter base plate and pivotally support the blades, causing the same to make parallel-linked movements, said first operating arm pivotally supporting one end of the slit forming blade at a side thereof near a slit forming edge thereof, and the second operating arm pivotally supporting the same end of the slit forming blade at an opposite side thereof further from the slit forming edge,

wherein the first auxiliary blade next succeeding the slit forming blade has its one end pivotally supported on one side thereof at the second operating arm, while the other side of said one end thereof is connected to the first operating arm with an arc groove and a pin and wherein a center of the radius of the arc forms a parallelogram together with two shafts of the two operating arms and a pivotally supporting point of the first auxiliary blade.

4,560,266

CAMERA

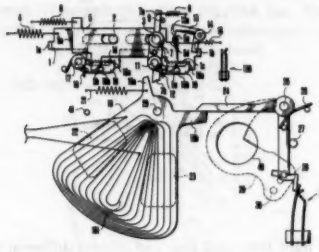
Akihiro Namai, and Ryoichi Suzuki, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 626,735

Claims priority, application Japan, Jul. 8, 1983, 58-125074

Int. Cl.⁴ G03B *3/10*

U.S. Cl. 354—400 **8 Claims**



1. An automatic focus adjustment device for a camera having an optical system for automatically performing focus adjustment of said optical system, comprising:

(a) focus adjustment means for adjusting said optical system to an in-focus state by a movement from a first position towards a second position;

(b) driving means for driving said focus adjustment means from the first position towards the second position;

(c) bias means for returning said focus adjustment means to the first position;

(d) blocking means for blocking said focus adjustment means from being returned by said bias means from its shifted position to the first position; and

(e) releasing means for placing said blocking means in an inactive state in response to said focus adjustment means as it reaches the second position, thus allowing said focus adjustment means to return to the first position by operation of said bias means.

4,560,267

CAMERA SYSTEM OPERABLE BY CARRYING DATA FROM A CAMERA ACCESSORY TO A CAMERA BODY

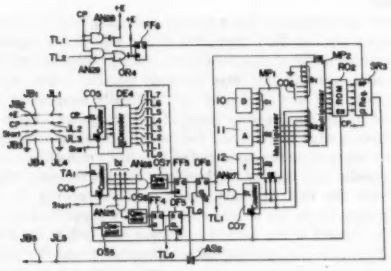
Masaaki Nakai, Nara; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1983, Ser. No. 478,910

Claims priority, application Japan, Mar. 26, 1982, 57-49768; Mar. 30, 1982, 57-52740; Apr. 1, 1982, 57-55187; Nov. 5, 1982, 57-194968; Feb. 2, 1983, 58-14929[U]

Int. Cl.⁴ G03B *7/091, 7/16, 7/20, 17/00*

U.S. Cl. 354—412 **31 Claims**



1. In a camera system operable by means transmitting data from a camera accessory to a camera body, the camera accessory comprising:

means for storing various data at a plurality of addresses, respectively, the data each consisting of a plurality of bits;

means for receiving a train of clock pulses from a camera body;

means for sequentially designating the addresses of said storing means one by one to let said storing means output a data stored at the designated address, including first means for originally forming at least a part of an address signal within the camera accessory in response to the clock pulses received by said receiving means to designate an address; and

means for transmitting the data derived from said storing means to the camera body, whereby there is no necessity to receive a prepared address signal from the camera body.

4,560,268

IMAGE FORMING APPARATUS WITH PRETRANSFER DISCHARGER

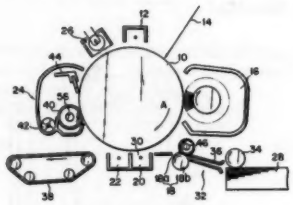
Fuminobu Nishimura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 8, 1983, Ser. No. 530,362

Claims priority, application Japan, Sep. 10, 1982, 57-158298

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **6 Claims**



1. An image forming apparatus comprising:

a rotatable image carrier for carrying an image formed thereon;

developing means for developing the image formed on the image carrier with a developer to form a developer image;

transfer means for transferring the developer image from the image carrier to a transfer paper, said developing means and transfer means both being arranged around the image carrier and with a space therebetween; and

paper supplying means for supplying the transfer paper to said space between the transfer means and the image carrier, said paper supplying means including a pair of paper feed rollers, arranged beside the image carrier and between the developing means and transfer means, for clamping and conveying the transfer paper, one of said paper feed rollers including discharge means therein for attenuating the holding force of the electric charges defining the electrostatic latent image on the image carrier.

4,560,269

CELL FOR MIXING OPERATIONS AND FOR OPTICAL EXAMINATION

Karl Baldszun, Schenefeld; Thomas Grazianski, and Günther Kühn, both of Hamburg, all of Fed. Rep. of Germany, assignors to Eppendorf Gerätebau Netheler & Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 14, 1983, Ser. No. 561,551

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246592

Int. Cl.⁴ G01N *21/03*

U.S. Cl. 356—246 **18 Claims**

1. In a cell for holding liquids to be mixed or to be subjected to optical examination, which cell comprises a bottom wall and

has a cavity defined by and rising from said bottom wall and including a measuring region defined by two mutually opposite, parallel, planar end wall portions adapted to transmit incident radiation into said measuring region, and two mutually opposite side wall portions,

the improvement residing in that

each of said planar end wall portions is joined to each of said side wall portions by an arcuate transitional wall portion and

each of said side wall portions has an inwardly curved portion, which has an apex and protrudes inwardly to such an extent that a horizontal tangent to said apex intersects said planar end wall portions.

4,560,270

DEVICE INCLUDED IN A DISTANCE METER SYSTEM

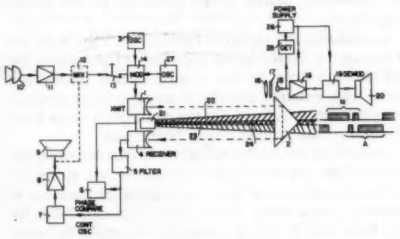
Klas R. Wiklund, Täby, and Mikael Hertzman, Sollentuna, both of Sweden, assignors to Geotronics AB, Sweden

Continuation of Ser. No. 399,084, Jul. 16, 1982, abandoned. This application Jan. 24, 1985, Ser. No. 693,837

Claims priority, application Sweden, Aug. 7, 1981, 8104743

Int. Cl.[4] G01C *3/08, 1/00;* **G01B** *11/26*

U.S. Cl. 356—5 **11 Claims**



1. An improved optical electronic distance measuring system including an operator positioned optical reflector and a transmitter/receiver for transmitting electromagnetic radiation in the visible or infrared wavelength region, modulated by a continuous periodic measuring signal, towards said optical reflector and for receiving modulated radiation reflected by said optical reflector, said transmitter/receiver further including distance circuit means for deriving a distance measurement, representative of the distance between said transmitter/receiver and said optical reflector, from a phase difference between said measuring signals modulated onto said transmitted and received radiation, characterized in that:

said transmitter/receiver includes first modulator means (**14,27**) with a first input connected to a source of an audible information signal (**10, 11** or **7–9**) and a second input connected to a source of said continuous periodic measuring signal, said modulator means modulating said audible information signal from said source onto said continuous periodic measuring signal,

said transmitter/receiver further includes filter means (**5**) to filter said audible information signal from a received signal produced from said received radiation before said received signal is coupled to said distance circuit means, and

an optical receiver (**16–20**) located adjacent said optical reflector (**2**) for responding to said transmitted radiation, said optical receiver including an optical or infrared detector (**15**) and demodulator circuit means (**19**) for demodulating an audible signal from said transmitted radiation,

wherein said first modulator means includes an auxiliary oscillator providing an auxiliary carrier and second modulator means for frequency, phase, or pulse code modulating said audible information signal onto said auxiliary carrier and amplitude modulating said modulated auxiliary carrier onto said continuous periodic measuring signal.

4,560,271

OPTICAL DISTANCE-MEASURING METHOD AND APPARATUS THEREFOR

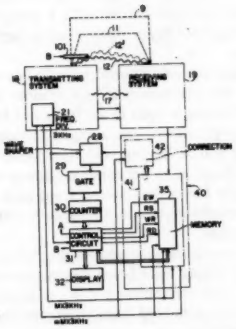
Ohtomo Fumio, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,138

Claims priority, application Japan, Apr. 8, 1982, 57-58620

Int. Cl.[4] G01C *3/08*

U.S. Cl. 356—5 **16 Claims**



1. In an optical distance-measuring method wherein light from a light-emitting source radiating modulated light is directed along a normal optical path to a point, the distance to which is being measured, reflected from said point and received by a light-receiving source, and the distance to said point is measured by the phase difference between the modulated signal from the light-emitting source and a received signal from the light-receiving source, the improvement comprising the steps of:

interrupting the normal optical path from said light-emitting source to said light-receiving source,

measuring a leakage signal from the light-emitting source to the light-receiving source when the normal optical path is interrupted,

storing the measured result of the leakage signal,

obtaining a composite signal when said normal path is not interrupted, and

correcting the composite signal by the measured result of the leakage signal, thereby obtaining the distance to said point.

4,560,272

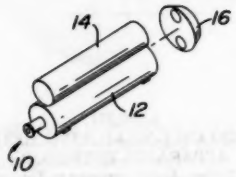
THREE-AXIS ANGLE SENSOR

Michael D. Harris, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 329,380, Dec. 10, 1980. This application Sep. 4, 1984, Ser. No. 646,547

Int. Cl.[4] G01B *11/27*

U.S. Cl. 356—138 6 Claims



1. A three axis sensor for sensing the angular position of a remote body in combination with a transceiver transmitting and receiving light beam signals and a target unit, the whole comprising:

(a) a target device adapted to be aligned with said transceiver for attachment to said remote body for receiving and reflecting a light beam from and to said transceiver;

(b) said target device including a reflective surface for receiving and reflecting said light beam to and from said autocollimator, an uncoated surface to permit a portion of said light beam transmitted from said autocollimator to pass therethrough, and a polarized surface polarized in a single plane;

(c) prism means within said target device for receiving the portion of said light beam passing through said uncoated surface and transmitting it to said polarized surface to produce a polarized light beam for transmission to said polarimeter;

(d) pitch and yaw detection means in said transceiver for receiving and examining the light beam reflected from said reflective surface to detect pitch and yaw variations in said target device;

(e) roll detection means in said transceiver for receiving and examining said polarized light beam from said polarized surface to detect roll variations in said target device;

(f) said roll detection means including a bifurcated analyzing element disposed in the path of said polarized light, said bifurcated analyzing element having contiguous first and second halves whose surfaces have polarization axes tilted with respect to each other whereby equal amounts of light pass through said surfaces when said bifurcated analyzing element is in a null position and different amounts of light pass through said surfaces when a roll movement of said target device with respect to said polarimeter is present; and

(g) null adjustment means for rotating said bifurcated analyzing element to a null position to detect the magnitude of roll of said target device with respect to said transceiver.

4,560,273

METHOD AND APPARATUS FOR INSPECTING PLATED THROUGH HOLES IN PRINTED CIRCUIT BOARDS

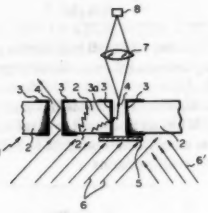
Moritoshi Ando, Atsugi; Kikuo Mita, Yokohama, and Yoshikazu Kakinoki, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 23, 1983, Ser. No. 554,543

Claims priority, application Japan, Nov. 30, 1982, 57-210110; Dec. 27, 1982, 57-228369; Dec. 27, 1982, 57-228375; Dec. 27, 1982, 57-228376; Dec. 28, 1982, 57-228672; Dec. 28, 1982, 57-228673; Dec. 28, 1982, 57-228676; Jan. 28, 1983, 58-11394; Jan. 28, 1983, 58-11395; Jan. 28, 1983, 58-11396

Int. Cl.[4] G01N *21/88*

U.S. Cl. 356—237 33 Claims



1. An apparatus utilizing a light source for inspecting plated through holes in a printed circuit board made of light-conducting material, comprising:

masking means for introducing light from the light source into the interior of the printed circuit board, said masking means preventing light from directly entering the plated through holes in the printed circuit board;

means, operatively connected to receive the light from the light source, for detecting the presence of the plated through holes;

means, operatively connected to receive the light from the light source, for detecting the presence of light within the plated through holes in the printed circuit board, said detected light entering the plated through holes through defectively plated walls of the plated through holes from the interior of the printed circuit board; and

means, operatively connected to said means for detecting the presence of the plated through holes and to said means for detecting the presence of light, for judging the presence of defectively plated walls of the plated through holes by signals from said detecting means for detecting the presence of the plated through holes and signals from means for detecting the presence of light within the plated through holes in the printed circuit board.

4,560,274

OPTICAL ALIGNMENT FOR WORKPIECE

Ronald K. McNeely, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 27, 1983, Ser. No. 489,182

Int. Cl.[4] G01B *11/26*

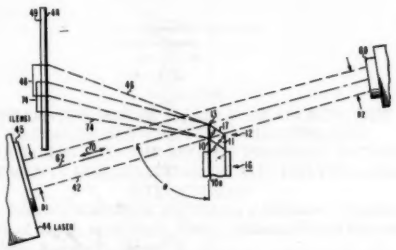
U.S. Cl. 356—154 8 Claims

1. A method of aligning two equilateral surfaces of the tip portion of an isosceles triangular pyramid workpiece with respect to the third surface of said tip portion and to a positioning ring attached to a holder supporting said workpiece, said holder adapted to rotate the third surface of said workpiece with respect to said positioning ring about an axis, said workpiece having a given dihedral angle between said two equilateral surfaces, comprising the steps of:

mounting said holder on an alignment platform adjacent a positioning block attached thereto for holding said positioning ring in a predetermined position;

exposing the third surface including said tip to an incident

collimated light beam that is sufficiently convergent so that a portion of said beam is reflected onto a first surface location of a screen, and so that the remaining portion of said beam continues past said third surface to be reflected from a mirror positioned substantially orthogonal to said beam, the mirror reflected beam being reflected, respectively, from said two surfaces onto spaced-apart surface locations of said screen different from said first surface location; and



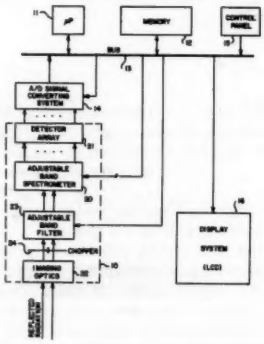
rotating said workpiece about said axis to change the surface location where the first reflected beam strikes said screen to a predetermined location on said screen within a calibrated portion thereof, whereby said respective mirror-reflected beams are correspondingly changed to surface locations calibrated to indicate the dihedral angle of said two surfaces relative to said first mentioned calibrated screen surface portion.

4,560,275

PORTABLE INSTANT DISPLAY AND ANALYSIS REFLECTANCE SPECTROMETER

Alexander F. H. Goetz, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Sep. 29, 1982, Ser. No. 428,311
Int. Cl.⁴ G01J *3/28*
U.S. Cl. 356—326 **12 Claims**



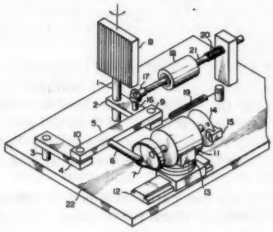
6. Apparatus for providing field identification of particular reflecting materials in minerals formations by identification of reflectance spectrum in a selected wavelength section using a spectrometer meter and an array of detectors, each section being chosen for a particular spectral characteristic of a material of interest selected from a group for which reflectance spectra are stored for comparison, comprising means for selecting from predetermined wavelength sections a series of contiguous narrow wavelength intervals of reflectance to be analyzed by measurement of light at said series of contiguous narrow wavelength intervals within said section using said spectrometer and array of detectors, means for simultaneously measuring reflectance detected by each detector of said array thereby to obtain a high resolution reflectance spectrum, and means for comparing said reflectance spectrum with individual ones of said stored spectra to determine which best matches said reflectance spectrum, thus identifying a particular material in said mineral formation giving rise to the reflectance measured at a selected section reflectance.

4,560,276

DIFFRACTION GRATING MOUNTING DEVICE FOR SCANNING MONOCHROMATOR

Shigeyoshi Yoshioka, Tokyo, Japan, assignor to Atago Bussan Co. Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,414
Claims priority, application Japan, Sep. 2, 1982, 57-132356[U]
Int. Cl.⁴ G01J *3/06, 3/18*
U.S. Cl. 356—334 **5 Claims**



1. In a diffraction grating mounting device for a scanning monochromator comprising:

(a) a base member;

(b) a diffraction grating;

(c) a diffraction grating supporting axle which integrally supports the diffraction grating and is rotatably supported by the base member;

(d) a first arm fixed to the diffraction grating supporting axle at right angles thereto;

(e) a second arm swingably supported on the base member in a uniplanar relation with the first arm;

(f) a link member connecting the first and the second arms at points equidistant from the rotational centers of the first and second arms, respectively, the distance between the points being equal to that between the rotational centers of the first and second arms;

(g) a cam follower axle fixed to the link member;

(h) a cam;

(i) a motor for driving the cam; and

(j) means for biasing the link member of the first and second arms so as to make the cam follower axle contact said cam;

the diffraction grating mounting device wherein said cam follower axle is fixed to said link member at right angles thereto and is located in a plane parallel to the plane formed by said first and second arms, said cam has a linear driving portion, and the rotational position of said cam is adjustable in a direction parallel to a line connecting the points at which said link member is connected to said first and second arms.

4,560,277

PROCESS AND DEVICE FOR QUALITATIVE AND QUANTITATIVE MEASUREMENT OF IRREGULARITIES AND IMPURITIES ON AND IN TRANSPARENT OR SEMITRANSPARENT FLEXIBLE SHEET MATERIALS

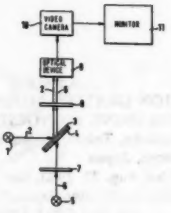
Helmut Monzer, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,758

Claims priority, application Fed. Rep. of Germany, May 17, 1982, 3218571

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—357 **24 Claims**



1. A process for the qualitative and quantitative measurement of irregularities and impurities on and in a transparent or semitransparent flexible materials in the form of a sheet, comprising the steps of:

placing the sheet on a reflecting reference surface;

producing interference fringes by obliquely directing a light beam onto the surface of the sheet, whereby one portion of the light beam is reflected from the surface to be examined, whereas another portion of the light beam is reflected from the reference surface to produce two partial beams;

superposing the two partial beams, whereby an interference field is obtained which is equivalent to the surface profile of the sheet;

evaluating the interference field to determine the extension of the surface profile in the horizontal and vertical directions with the aid of the distances between the interference fringes and the wavelength of the irradiated light;

passing a polarized light beam through the sheet;

passing the polarized light beam which has passed through the sheet through a second polarizer; and

evaluating the polarized light beam which has passed through the second polarizer.

4,560,278

FIXED-SLIT TYPE PHOTOELECTRIC MICROSCOPE

Toshiaki Shinozaki, Yokohama, and Ichiro Mori, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1983, Ser. No. 513,452

Claims priority, application Japan, Aug. 25, 1982, 57-147054

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—364 **18 Claims**

1. A fixed-slit type photoelectric microscope for inspecting an object comprising:

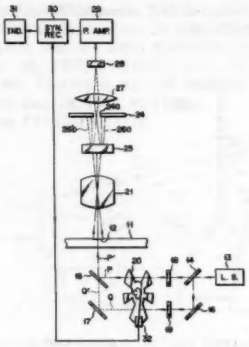
irradiating means for irradiating a linear pattern of the object alternately by a pair of polarized light beams having planes of polarization orthogonal to each other;

image formation means for forming an image of said linear pattern by the pair of polarized light beams illuminating said linear pattern;

optical deflecting means for deflecting the pair of polarized light beams passed through said image formation means in different directions;

single slit means fixed at a point conjugate to said linear pattern with respect to said image formation means, different portions of said slit means being selectively illuminated by the pair of polarized light beams deflected by said optical deflecting means;

photoelectric converting means for converting the pair of polarized light beams transmitted through said slit means into an electrical signal;



synchronous rectifying means for rectifying the electrical signal from said photoelectric converting means in synchronism with the alternate irradiation of the pair of polarized lights by said irradiating means, thereby producing a rectified signal; and

indicating means for visualizing said rectified signal.

4,560,279

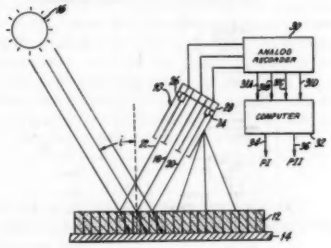
OPTICAL METHOD FOR REMOTE DETERMINATION OF THE GEOLOGICAL NATURE OF A HOMOGENEOUS SURFACE

Charles W. Kouns, 2505 Central Ave., Alexandria, Va. 22302

Continuation-in-part of Ser. No. 952,059, Oct. 17, 1978, abandoned. This application Feb. 17, 1981, Ser. No. 234,748

Int. Cl.⁴ G01N *21/21*

U.S. Cl. 356—369 **5 Claims**



1. A non-contact method for remote sensing of the homogeneity of a substantially horizontal unidentified target surface comprising:

electro-optically detecting a train of optical waves reflected from said target surface with a photopolarimeter;

calculating the polarization intensities (PI's) of said detected optical wavelengths in four preselected spectral wave bands, λ_n, through λ_{n+3}, wherein $0.5<\lambda_n\leqq 0.6$ micrometers, $0.6<\lambda_{n+1}\leqq 0.7$ micrometers, $0.7<\lambda_{n+2}\leqq 0.8$ micrometers and $0.8<\lambda_{n+3}\leqq 1.1$ micrometers;

calculating a polarization intensity index (PII) for said target surface by ratioing the difference between ($PI\lambda n$-$+PI\lambda n+1$) and ($PI\lambda n+2+PI\lambda n+3$) with the sum of

(PIλn+PIλn+1)+(PIλn+2+PIλn+3), provided that the PI of the four wave bands define two conjugate pairs PIλn with PIλn+1 and PIλn+2 with PIλn+3 each conjugate pair having the same PI, and the conjugate pairs PIλn with PIλn+1 and PIλn+2 with PIλn+3 being different from one another; and

comparing the calculated PII for said target surface with PII values for predetermined target surfaces to identify said unidentified target surface.

4,560,280

APPARATUS FOR OPTICALLY MEASURING THE DISTANCE BETWEEN TWO GRATING-LIKE STRUCTURES AND THE SIZE OF PERIODIC PATTERN ELEMENTS FORMING ONE OF THE GRATING-LIKE STRUCTURES

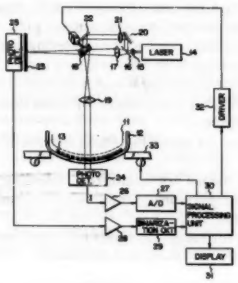
Akito Iwamoto, Kamakura, and Hidekazu Sekizawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 17, 1983, Ser. No. 523,768

Claims priority, application Japan, Aug. 31, 1982, 57-149981; Aug. 31, 1982, 57-149982

Int. Cl.⁴ G01B *11/02, 11/14*

U.S. Cl. 356—375 **10 Claims**



1. An apparatus for measuring the distance between first and second grating-like structures each having periodic pattern elements or the size of the pattern elements of said second grating-like structure comprising:

a light source;

an optical system located between said light source and an assembly of said first and second grating-like structures for applying to said first grating-like structure substantially parallel rays of light having a diameter greater than the pitches of said pattern elements of said first and second grating-like structures, said optical system being arranged to vary an incident angle of substantially parallel rays of light to said first grating-like structure;

a photodetector means for detecting light passed through said first and second grating-like structure assembly to produce an electric signal having an amplitude corresponding to a quantity of light passed through said assembly; and

a signal processing unit for driving said optical system to vary the incident angle of the parallel rays of light to said first grating-like structure and evaluating a measurand of said first and second grating-like structure assembly on the basis of the electric signal from said photodetector means whose amplitude periodically varies with variation in the incident angle of the parallel rays of light.

4,560,281

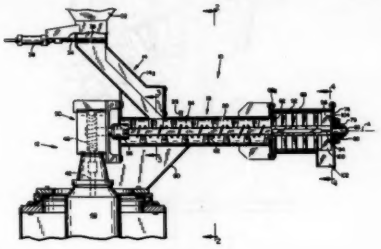
FOUNDRY APPARATUS FOR MIXING SAND WITH BINDER

David L. Harris, Oregon City, and Colin Taylor, Lake Oswego, both of Oreg., assignors to Foundry Automation, Inc., Clackamas, Oreg.

Filed Apr. 16, 1984, Ser. No. 600,425

Int. Cl.⁴ B28C *1/16, 5/14*

U.S. Cl. 366—15 **25 Claims**



1. Foundry apparatus for mixing sand with binder ingredients to produce a composite mixture suitable for foundry molds comprising:

first premixing means defined by a first tubular chamber enclosing a first bladed shaft mounted for rotation about a substantially horizontal first axis operable for conveying and commingling sand with a first binder ingredient to produce a first sand/binder ingredient mixture;

second premixing means defined by a second tubular chamber disposed adjacent and separate from the first premixing means enclosing a second bladed shaft mounted for counterrotation about a second axis, substantially parallel to the first axis, for conveying and commingling sand with a second binder ingredient to produce a second sand-/binder ingredient mixture;

final mixing means defined by a blending chamber enclosing a first agitator means rotatably driven by the first bladed shaft and a second agitator means rotatably driven by the second bladed shaft operable for receiving and blending the first and second sand/binder ingredient mixtures into a composite mixture while simultaneously transporting the composite mixture to a final discharge station, the first agitator means being rotatable about a longitudinal axis aligned with the first axis and the second agitator means being rotatable about a longitudinal axis aligned with the second axis; and

single power-driven means operable for driving the first and second bladed shafts.

4,560,282

APPARATUS FOR MIXING AND GRANULATING POWDERY SUBSTANCES WITH A SIFTING DEVICE ATTACHED BY MEANS OF A VALVE CLOSURE

Gerhard Gergely, Gartengasse 8, A-1053 Vienna, Austria

Continuation of Ser. No. 332,066, Dec. 18, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,964

Int. Cl.⁴ B01F *7/08, 15/02*

U.S. Cl. 366—134 **4 Claims**

1. A device for mixing and granulating powdered or granular substances, comprising

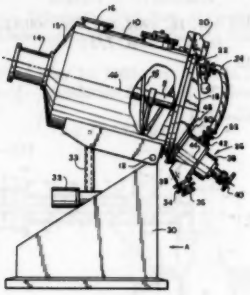
an evacuable container having a lid attached thereto for opening and closing the container,

mixing, stirring and conveying means situated inside said container for mixing, stirring and conveying the substances in the container,

a substance inlet valve connected to the lid of the container for introducing the substances into the container, and

a sifting device connected to the lid, said sifting device including a cylindrical body hingedly connected to the

lid, said body having a first outlet with an outlet valve for opening and closing the first outlet and a second outlet in fluid communication with the inlet valve, a cylindrical sieve situated inside the body, rotating discharge means



situated inside the sieve for discharging the granulated substances in the container from the first outlet through the sieve, and a disk valve situated inside the sifting device for closing the sifting device from the container if necessary.

4,560,283

APPARATUS FOR CLOSING AND CONTINUOUSLY EMPTYING THE CONTAINER OF A TREATMENT MACHINE

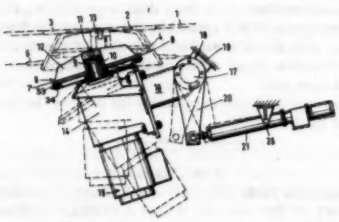
Paul Eirich, Bahnhofstr. 11; Hubert Eirich, Sandweg 1; Walter Eirich, Spessartweg 18, and Erwin Goldschmidt, all of Hardheim, Fed. Rep. of Germany, assignors to Paul Eirich; Hubert Eirich and Walter Eirich, all of Hardeim, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,565

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302109

Int. Cl.⁴ B01F *15/02*

U.S. Cl. 366—188 **14 Claims**



1. Apparatus for closing and continously controlling the emptying of material from the container of a processing machine having a bottom with an emptying opening therein, comprising a closure cover, mounting means outside the container opening to mount the cover for rotation about an axis adjacent the bottom of the container, lifting means to displace said cover so that it can be moved into and out of the emptying opening, a rotary drive means connected to said cover to rotate it about said axis and having a separately-controlled rotary speed control to control the flow of material through the opening a control drive means coupled to the lifting means for precise adjustment of the position of the mounting means to control the position of the cover relative to said opening, and a discharge hopper which flares outwardly from said opening in a frustoconical configuration so as to surround the closure cover, the displacement of said cover varying the clearance between the outer periphery of the cover and the inside of the hopper.

4,560,284

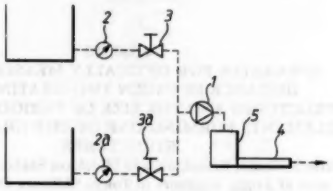
CONTINUOUS TYPE OF FLUID MIXING AND FEEDING DEVICE

Hwang C. Chen, 2nd Flr., No. 16, La. 282, Min Tzwu W. Rd., Taipei, Taiwan

Filed Nov. 21, 1983, Ser. No. 554,103

Int. Cl.⁴ B01F *5/06*

U.S. Cl. 366—336 **9 Claims**



1. A device for the continuous mixing and feeding of fluids comprising:

two fluid sources, each containing one of the fluids to be mixed,

conduits for receiving fluids from said sources;

a primary pipe for converging fluids from said conduits;

a first means, coupled to said primary pipe, for mixing fluids including rotary means, for scattering and converging the fluids received from said primary pipe;

a first pipe for receiving fluids from said first mixing means;

means for varying the pressure of fluids communicated from said first pipe;

a second pipe for receiving fluids from said pressure varying means;

multi-stage means for scattering, whirling, separating and varying the pressure of the fluids communicated from said second pipe; and

a third pipe for receiving fluids from said multi-stage means.

4,560,285

MATERIAL BLENDING SYSTEM

Glen W. Fisher, Bellevue, Wash., assignor to Technovators, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 378,203, May 14, 1982, abandoned. This application May 9, 1983, Ser. No. 490,352

Int. Cl.⁴ B01F *5/24*

U.S. Cl. 366—341 **13 Claims**

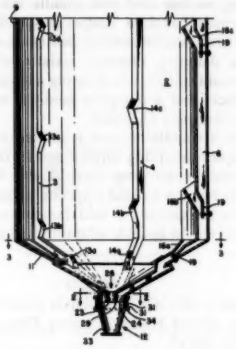
1. A method for blending particulate material contained within an enclosure of substantially uniform cross-section defining a vertically extending zone comprising the steps of:

removing material from the bottom of said enclosure to establish substantially laminar mass flow in said zone;

simultaneously withdrawing material from a plurality of vertically spaced locations within said zone in a flow passageway through openings in said passageway, dividing the passageway adjacent to each opening into two separate non-communicating flow channels, one of said flow channels communicating with the flow of material from higher locations in said passageway and the other of said flow channels communicating with the associated opening, and extending said flow channels in substantially uniform cross-section a sufficient distance below the associated opening to eliminate particle-to-particle turbulence therein so as to create laminar mass flow of the material at the exit of each said flow channel;

combining the material withdrawn at any given location with material withdrawn from higher locations in said passageway in predetermined proportion in laminar mass

flow therewith in said passageway, whereby material enters said opening in proportion in the relative flow channel cross-sectional area at the exit end thereof and combines with material from higher locations in proportion to the relative cross-sectional areas of said flow channels; and



combining the material withdrawn from said zone in said passageway in predetermined proportion with material withdrawn from the bottom of said enclosure so as to effect blending of the material withdrawn.

4,560,286

OPTICAL TEMPERATURE MEASUREMENT TECHNIQUES UTILIZING PHOSPHORS

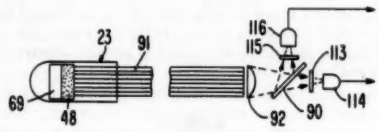
Kenneth A. Wickersheim, Palo Alto, Calif., assignor to Luxtron Corporation, Mountain View, Calif.

Division of Ser. No. 167,691, Jul. 10, 1980, Pat. No. 4,448,547, which is a continuation-in-part of Ser. No. 877,977, Feb. 15, 1978, Pat. No. 4,215,275, which is a continuation-in-part of Ser. No. 751,366, Dec. 16, 1976, Pat. No. 4,075,493. This application Dec. 5, 1983, Ser. No. 558,305

Claims priority, application United Kingdom, Dec. 7, 1977, 51006/77

Int. Cl.[4] G01N *21/31*; G01J *5/02*

U.S. Cl. 374—131 **27 Claims**



1. For a temperature measuring system having a visible or near-visible electromagnetic radiation detector optically coupled to one end of at least one optical fiber for receiving radiation from said one fiber that is indicative of temperature, a radiation emitting temperature sensor, comprising:

a carrier shaped for removable attachment to another end of said at least one optical fiber and adapted to be positioned in heat conductive relationship with an environment whose temperature is to be measured, and

a quantity of phosphor material attached to said carrier in a position to emit radiation that is viewable by said detector at said at one end of said at least one one optical fiber when said carrier is attached to said another end, said phosphor material being characterized by emitting, when excited, detectable optical radiation that varies as a known function of the phosphor material temperature.

4,560,287

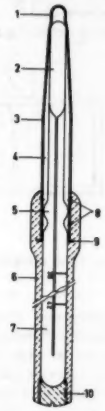
SAFETY CASE FOR THE MEDICAL GLASS THERMOMETER

Ahmed M. Tantawi, P.O. Box 2031, Cairo, Egypt

Continuation of Ser. No. 365,413, Apr. 5, 1982, abandoned. This application May 10, 1984, Ser. No. 608,916

Int. Cl.[4] G01K *1/08*

U.S. Cl. 374—194 **3 Claims**



1. A protective case for a conventional fever thermometer having a bulb holding a heat expandable medium and having an exterior surface adapted to be placed in contact with tissue the temperature of which is to be measured, and a main thermometer body contiguous with the bulb and including means for displaying the measured tissue temperature, the protective case comprising an elongated, substantially rigid cap dimensioned to be placed over the bulb so that substantially the entire bulb is disposed within the cap, the cap being constructed so that an interior surface thereof is spaced apart from the bulb, the cap including an open end facing towards the main thermometer body, a generally radially outwardly extending protrusion and a plurality of apertures; securing means extending from the cap towards the main thermometer body and permitting the viewing of the temperature displaying means, the securing means including a first, open end facing the cap, a recess receiving the protrusion on the cap and a thermoplastic material molded over a portion of the cap proximate the open end so that the thermoplastic material extends into the apertures to permanently secure the cap to the securing means; and a flowable substance disposed within the cap for filling a space between the bulb and the interior cap surface when the cap is placed over the bulb, the substance having a sufficient heat conductivity so that the temperature sensed by the bulb substantially equals the temperature of a tissue after the cap is brought into contact with the tissue.

4,560,288

THERMOMETER FOR MEASURING CRYOGENIC TEMPERATURES

Koichi Nara, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,537

Claims priority, application Japan, May 20, 1983, 58-88758

Int. Cl.[4] G01K *5/00*

U.S. Cl. 374—201 **15 Claims**

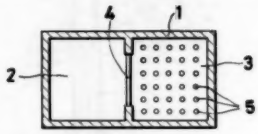
1. A thermometer for the measurement of cryogenic temperatures, said thermometer comprising:

(a) a first sample space having sealed therein a first gas which is liquefiable at a cryogenic temperature, said first

gas having a predetermined first pressure at a predetermined first temperature;

(b) a second sample space adjoining said first sample space and having sealed therein a second gas which is liquefiable at a cryogenic temperature and an adsorbent, said adsorbent being present in said second sample space in sufficient quantity to at least substantially completely absorb all of said second gas at a cryogenic temperature, said second gas having a predetermined first pressure at a predetermined first temperature; and

(c) a pressure difference detecting element operatively con-



nected to both said first sample space and said second sample space,

whereby:

(d) said pressure difference detecting element detects changes in the pressure differential between said first and second sample spaces as said first and second sample spaces are subjected to cryogenic temperatures different from their first predetermined temperatures; and

(e) said changes in the pressure differential between said first and second sample spaces provide a measure of the cryogenic temperature to which said first and second sample spaces are subjected.

4,560,289

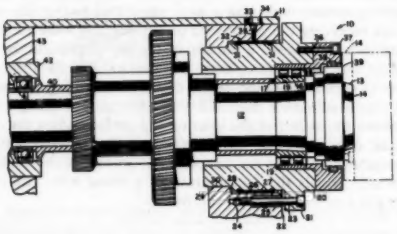
SPINDLE MOUNTING ASSEMBLY WITH SQUEEZE FILM DAMPING

David B. Wood, III, West Chester, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation of Ser. No. 610,213, Jul. 11, 1984, abandoned, which is a continuation of Ser. No. 477,359, Mar. 21, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,753

Int. Cl.⁴ F16C *27/00*

U.S. Cl. 384—99 **6 Claims**



1. A damped spindle assembly for a machine tool comprising:

a rotatable machine spindle having a spindle nose at one end and respective spindle bearings mounted proximal to said spindle nose and the opposite spindle end; a machine base having bearing mounting means for radially fixing said opposite spindle end bearing and having an outer base surface proximal said spindle nose end; an elongate damping cavity extending axially along said spindle into said base from said outer base surface to a cavity end, between said bearing mounting means and said outer surface; a spindle adapter mounting surface on said base proximal to said cavity end; an elongate spindle adapter having a spindle nose bearing mount proximal one end supporting said spindle nose bearing, and having an adapter mounting surface on said adapter proximal said opposite end; means for radially and axially securing said spindle adapter mounting surface to said base adapter mounting surface; an elongate damping surface on said spindle adapter extending axially along said spindle between said adapter mounting surface and said spindle nose bearing mount, said damping surface cooperatingly conformed to an spaced from said damping cavity thereby forming an elongate damping chamber axially along said spindle between said spindle nose bearing and said adapter mounting surface; and a damping medium maintained in said elongate damping chamber

whereby said spindle adapter is affixed at one end to said base adapter mounting surface and its free end and therein-mounted spindle nose are relatively free to move radially with respect to said opposite spindle bearing while vibrations are damped in said damping chamber at a location between the spindle adapter fixed and free ends.

4,560,290

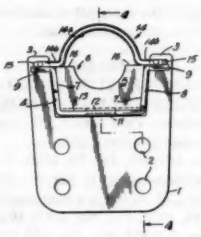
HALF BLOCK BEARING ASSEMBLY

Craig Siebert, Sleepy Hollow Country Club, Rte. 9, Briarcliff Manor, N.Y. 10510

Filed Sep. 4, 1984, Ser. No. 646,842

Int. Cl.⁴ F16C *35/02*

U.S. Cl. 384—434 **12 Claims**



1. A bearing assembly comprising a mounting bracket; a bushing cradle mounted on said bracket and having walls defining a recess; a half block bushing having an indentation in one wall for supporting the journal therein, and other walls having a shape corresponding to the shape of the recess of said cradle, said half block bushing being stably positioned by said other walls in the recess of said cradle; and removable retaining means for securing said bushing in position relative to said cradle and said bracket.

4,560,291

CAGE FOR BALL BEARINGS, ESPECIALLY FOR INCLINED BALL BEARINGS

Roland Bonengel, Geldersheim; Herbert Dobhan, Bergrheinfeld; Manfred Brandenstein, Eussenheim; Ludwig Edelmann, Premich; Horst M. Ernst, Eltingshausen; Helmuth Kregler, Schweinfurt; Anton Marx, Sulzthal; Gunter Neder, Schweinfurt; Elmar Mause, Schweinfurt; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld, and Robert Stolz, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,836

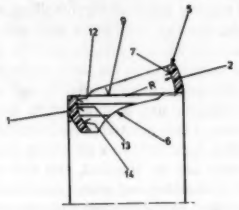
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247948

Int. Cl.⁴ F16C *33/38*

U.S. Cl. 384—533 **8 Claims**

1. In a cage for a ball bearing comprising first and second side rings interconnected by a plurality of webs to define there-

with a plurality of pockets distributed circumferentially around the cage for receiving balls of a given diameter, the pockets having first sections radially outwardly of the pitch circle defined by the centers of the balls and second sections radially inward of said pitch circle, the first sections being displaced axially of the cage with respect to the second sections, one of said first and second sections having a plurality of zones at different radial distances from the axis of said cage with different inclinations to said axis, with the one of said zones most remote from said pitch circle comprising a conical



surface; the improvement wherein the other of said first and second sections have curved walls facing the respective said pockets with radii greater than the radii of the balls in said pockets, the centers of curvature of said curved walls being on the opposite side of pitch circle as the respective said other sections and being closer to said one of said first and second sections than said centers of said balls, in the axial directions of said cage, at least two of said zones of said one of said first and second sections being conical, said one of said zones being positioned to guide the respective balls in the radial direction of said cage.

4,560,292

PRINTER COMPRISING SPRING BIASED PRINT HEAD AND ROLLER PLATEN

Naoki Takahashi, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Mar. 20, 1984, Ser. No. 591,410

Claims priority, application Japan, Mar. 25, 1983, 58-44046[U]

Int. Cl.⁴ B41J *11/04, 15/06, 3/20*

U.S. Cl. 400—59 **3 Claims**

1. A printer wherein a narrow strip of sheet paper drawn out from a roll-holding section is passed between a platen roller and a print head, said printer comprising:

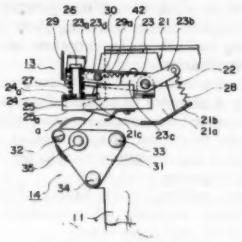
a paper path extending from a paper holding unit and passing between said print head and platen roller having a clearance determined by the distance between said print head and said platen roller;

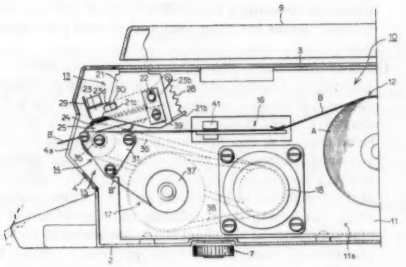
means for supporting said platen roller and print head in a cantilevered manner on a first frame, said print head being capable of rotation upon said frame, said support means including a pivot means, comprising a shaft, about which said rotation may occur, said rotation being such that the clearance between said print head and printing roller may be increased or decreased dependent upon the direction of said rotation, said printer being in a print mode when said clearance is substantially at a minimum and in a paper loading mode when said clearance is sufficient to permit said narrow sheet of paper to be freely inserted between said print head and said print roller;

means for locking said printer in said paper loading mode;

means for biasing said print head against said platen roller when said printer is in said printing mode; and

a removable said cover, said paper path being positioned so that, when said side cover is removed, an open side is formed from which a paper holding unit may be rotatably placed for support within said printer and paper from said paper holding unit freely inserted in said paper path when said printer is in said paper loading mode, said support means further comprising printing a head support, including a second frame attached thereto and mounted to said first frame, and a pressing member, said print head being attached to said pressing member by a first spring for





biasing said print head toward said platen roller when said printer is in a print mode, said pressing member being pivotally mounted on said second frame about said pivot means.

4,560,293

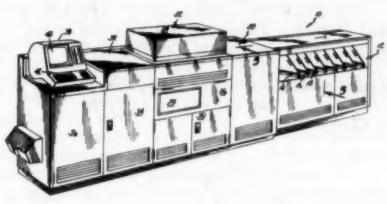
DOCUMENT PRINTING METHOD AND APPARATUS

Roger D. McCumber, Minnetonka; Thomas L. Peterson, Lakeville, and Gerry A. Lee, Prior Lake, all of Minn., assignors to Check Technology Corporation, Eden Prairie, Minn.

Filed Oct. 14, 1983, Ser. No. 542,037

Int. Cl.⁴ B41J *5/30;* **G06F** *11/00*

U.S. Cl. 400—61 **28 Claims**



1. A system for printing and assembling business documents, comprising:

(a) a stationary frame;

(b) means for holding a plurality of stacks of paper sheet stock upon which characters are to be printed, each of said stacks containing sheet stock of the same characteristic but differing from the characteristic of sheet stock in other of said stacks, said means for holding said plurality of stacks being mounted on said frame;

(c) a first printing station having a printing apparatus thereat for printing alpha/numeric characters, said printing apparatus having a paper inlet and a paper outlet;

(d) first paper transfer means for transferring paper sheets drawn from said means for holding a plurality of stacks of paper sheet stock to said first printing station, said first paper transfer means including sheet aligning means for orienting paper sheets for entry into said paper inlet of said printing apparatus;

(e) paper pick means operatively coupled to said means for holding a plurality of stacks of paper sheet stock and, when actuated, for selectively extracting paper sheets, one at a time, from ones of said plurality of stacks of paper sheet stock and depositing the selected sheets of said paper transfer means in serial order;

(f) a second printing station having printing means thereat for printing magnetic ink characters at predetermined locations on said paper sheets;

(g) second paper transfer means disposed between said paper outlet of said printing apparatus at said first printing station and said second printing station for transporting the paper sheets exiting said paper outlet of said printing apparatus at said first printing station and orienting said paper sheets along a longitudinal axis of said second paper transfer means for entry into said second printing station; and

(h) microprocessor means including memory means, said memory means storing (i) a program of instructions executable by said microprocessor means, (ii) a first addressable array containing the data defining the symbols to be printed at said first and second printing stations, (iii) a second addressable array containing data defining the printing format and locations on said paper sheets where said symbols are to be placed, and (iv) a third addressable array containing data defining the identification of the characteristics of the sheet stock contained in each of said plurality of stacks, said microprocessor means further including (i) means responsive to said program of instructions for sending control signals to said paper pick means for selecting sheets of a desired characteristic from said stacks in a prearranged order determined by the contents of said third addressable array, (ii) means responsive to said program of instructions for sending control signals to said first and second paper transfer means for transporting the selected sheets in a timed serial order to said first and second printing stations, and (iii) means responsive to the contents of said first array for sending control signals to said first and second printing stations for printing predetermined symbols on said sheets at predetermined locations defined by the contents of said second array.

4,560,294

PRINTER WITH MULTIPLE TYPE GROUPS

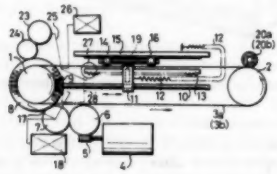
Fukuo Sugawara, Yokohama, and Yasuhiko Iwane, Morioka, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jan. 30, 1984, Ser. No. 574,909

Claims priority, application Japan, Jan. 29, 1983, 58-12109

Int. Cl.⁴ B41J *1/20, 11/00*

U.S. Cl. 400—145 **7 Claims**



1. A printer comprising paper feed means for feeding a sheet of print paper in a prescribed direction, a plurality of type groups arranged in tiers along said prescribed direction and each having a set of types, a pair of endless type belts spaced in said prescribed direction and supporting said type groups, respectively, a hammer assembly shiftable across said tiers of said type groups for pressing a selected one of said types against said sheet of print paper, means for shifting said hammer assembly across said tiers of said type groups, an arithmetic unit for computing a next amount of feed of the sheet of print paper based on a position of said selected type with reference to a direction across said tiers of said type groups, and paper feed control means for controlling said paper feed means to feed the sheet of print paper and said shifting means to shift said hammer assembly in relation to each other for intervals of time controlled on the basis of the amount of feed of the sheet of print paper as computed by said arithmetic unit, wherein said arithmetic unit is arranged to feed the sheet of print paper to bring a first printed position printed with one of said pair of endless type belts to a checking position in which a printed condition can be checked, and also to compute an amount of feed of the sheet of print paper to effect printing along a next line in a second printed position printed with one of said pair of endless type belts and spaced from said first printed position by a predetermined interlinear pitch, said first printed position in the checking position being spaced from one of said endless type belts by ½ of said interlinear pitch, and said first printed position in the checking position being spaced from the other of said endless type belts by said interlinear pitch.

4,560,295

SHEET PRESSER MECHANISM FOR RECORDERS WITH PIVOTABLE COVER PLATE

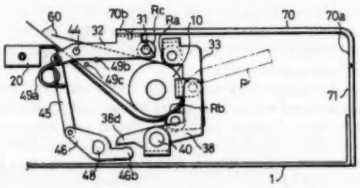
Mitsugu Fujiwara; Yoshinori Sakaue, both of Morioka; Tomio Aso, Kitakami; Koshiro Kurokawa, Hanamaki, and Hideo Obara, Ezuriko, all of Japan, assignors to Alps Electric Co. Ltd., Japan

Filed Jun. 16, 1983, Ser. No. 505,081

Claims priority, application Japan, Jun. 17, 1982, 57-90831[U]; Jun. 17, 1982, 57-90832[U]; Jun. 17, 1982, 57-90833[U]; Jun. 17, 1982, 57-90834[U]

Int. Cl.⁴ B41J *13/042, 29/02*

U.S. Cl. 400—637.1 **5 Claims**

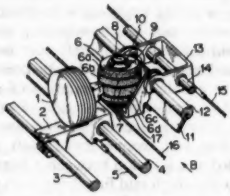


1. A mechanism for use in a recorder for pressing a sheet of recording paper against a platen, including two support members located at respective end portion of the platen to define a printing area of the recording paper therebetween, said support members each carrying a pair of rollers spaced circumferentially around said platen, a presser bar lying along the platen and spaced circumferentially from said rollers and said printing area, means including a pivotally mounted cover extending over the platen to shield said printing area, and means responsive to pivotal movement of said cover for moving each of said rollers and said presser bar away from the platen to enable positioning of the recording paper relative to said platen.

4,560,296
COLOR PRINTER

Susumu Hanyu, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 616,434
Claims priority, application Japan, Jun. 10, 1983, 58-102728
Int. Cl.⁴ B41J *11/02*
U.S. Cl. 400—649 **5 Claims**

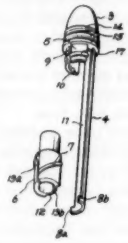


1. A color printer, comprising: a guide shaft; a printing head slidably mounted on said guide shaft; a control shaft having a center axis and being parallel to said guide shaft, a platen slidably mounted on said control shaft so as to be arranged opposite to said printing head and having a central axis oriented in a plane normal to said control shaft and said guide shaft, said platen being formed as a body of revolution with a generally circular cross section taken in a plane normal to said central axis, said platen being turnable in said plane and rotatable around said central axis, said platen also having a plurality of layers respectively containing ink of different color, said layers being adjacently and coaxially arranged on said central axis of said platen so as to form an outer working surface, said outer working surface being defined by a circular arc having a predetermined radius centered at said center axis of said control shaft so that any one selected layer of said plurality of layers is positionable to directly confront said printing head with a constant predetermined spacing therebetween; and means for carrying said platen and being turnable so that different layers of said platen confront said printing head.

4,560,297
WRITING IMPLEMENT

Tae Yoon Leem, 52-204, Walker Hill Apt., Kawngjang-dong, Sungdong-Ku, Seoul, Rep. of Korea

Filed Jun. 28, 1983, Ser. No. 508,655
Claims priority, application Rep. of Korea, Jul. 2, 1982, 5204/1982
Int. Cl.⁴ B43K *21/08, 27/00*
U.S. Cl. 401—31 **4 Claims**



1. In a writing implement having an elongated hollow barrel with an inner wall surface, a spiral groove on the inner wall surface, a cap rotatably attachable to one end of the barrel, a bore through the cap coaxial with the central axis of the barrel to slidingly receive a writing element therein, a part annular elongated supporting member having longitudinal edges attached at the outer end to the cap and extending from the cap into the hollow barrel to be rotated within the barrel by rotation of the cap, a carrier within the barrel adapted to engage with the writing element, and a guide element projecting from the outer surface of the carrier engaging in the spiral groove, the carrier engaging with the supporting member so that rotation of the cap and supporting member with respect to the barrel drives said carrier rotatably and axially in said barrel to move the writing element in both directions through the cap, the improvement comprising:

the carrier is in the form of a cylindrical tubular member having inner and outer ends and in which the writing element is receivable in gripping engagement therewith;

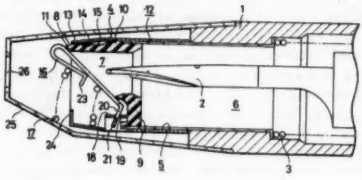
a part annular recess in the outer surface of the carrier substantially conforming to and slidably receiving therein the part annular supporting member, said recess forming axially extending shoulders engageable in abutting relationship with the longitudinal edges of the support member; and

at least one carrier stop element extending part circumferentially from at least one of the longitudinal edges of the support member engageable with said inner end of the carrier to limit the travel of said carrier inwardly of the barrel.

4,560,298
OPENING AND CLOSING DEVICE FOR RETRACTABLE NIB FOUNTAIN PEN

Takeo Oki, and Katsutoshi Ichikawa, both of Kanagawa, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1982, Ser. No. 441,011
Claims priority, application Japan, Nov. 20, 1981, 56-186634
Int. Cl.⁴ B43K *9/00, 5/16*
U.S. Cl. 401—107 **9 Claims**



1. An opening and closing device for the front end of a retractable nib fountain pen, comprising;

a cylindrical holder;

a cylindrical elastic head portion having a communicating hole communicating with a throughhole of said holder, and a tapered front end in which said communicating hole opens, at least said tapered front end being made thinner in thickness than other portions of said elastic head portion;

a cover supporting tube having a tip portion at least partially surrounding an outer surface of said elastic head portion and including means limiting the amount of elastic deformation of said tapered front end;

a cover plate rotatably supported by said cover supporting tube and movable into and out of engagement with the tapered front end of the elastic head portion;

spring means biasing the cover plate against the tapered front end for closing the communicating hole in the elastic head portion;

wherein said means limiting the amount of elastic deformation of said tapered front end comprises an inwardly bent portion of said cover supporting tube having an end positioned at a point on said elastic head portion where said tapered front end terminates and said elastic head portion is of uniform thickness; and

an annular cap surrounding said cover supporting tube and separated therefrom, said cap having an opening through

which a nib of said fountain pen protrudes when said opening and closing device is opened.

4,560,299

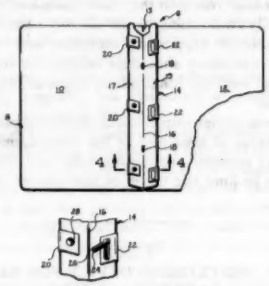
PRESENTATION FOLDER

Edward Podosek, Wilbraham, Mass., assignor to Dennison National Company, Holyoke, Mass.

Filed Apr. 6, 1984, Ser. No. 597,422

Int. Cl.[4] B42F *3/02, 13/00*

U.S. Cl. 402—15 **1 Claim**



1. Loose leaf folder having a cover with hinged front and back cover panels and a binder strip disposed within the folder comprising two narrow panels defined by a hinge line and tabs of metallic foil bonded in laterally spaced, corresponding relation along opposed outer edge portions of said narrow panels, each of the tabs disposed along one edge of the strip having a hole through the tab and the underlying portion of the strip, each of the tabs disposed along the outer edge of said strip including a pair of superimposed, elongated, bendable prongs, said tabs including portions which are reversibly folded over opposed outer edge portions of said strip and being bonded with a heat-responsive adhesive coating to the opposite surfaces of said binder strip, said prongs being dimensioned to fit through the hole in an opposite tab to releasably retain loose leaf sheets within said folder with their perforated edge portions retained by the interengagement of said prongs and the holes in said opposite tabs, said bendable prongs having their longer dimension disposed parallel to the fold line of the binder strip.

4,560,300

DISENGAGEABLE COUPLING MECHANISM FOR A DRIVE SHAFT ASSEMBLY

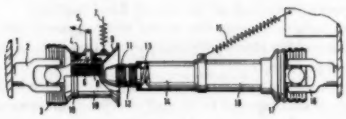
Jürgen Vollmer, Lohmar, and Paul Herchenbach, Ruppichteroth, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Siegburg, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,458

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307339

Int. Cl.[4] F16D *1/10*

U.S. Cl. 403—11 **2 Claims**



1. A drive shaft assembly for providing a drive connection between the power take-off shaft of a tractor and an agricultural implement comprising:

a first drive shaft part having an end adapted to be connected with the power take-off shaft of a tractor;

a second drive shaft part having an end adapted to be connected with an implement to be driven;

a coupling sleeve in said first drive shaft part and a coupling hub in said second drive shaft part adapted to be connected with each other to place said first and second drive shaft parts in driving engagement and to be disconnected to separate said driving engagement; and

a length adjusting device comprising a pair of telescoping tubes including a spring applying a longitudinal biasing force therebetween, said length adjusting device being provided in said second drive shaft part between said coupling hub and said end adapted to be connected with an implement to enable length variation of said second drive shaft part to facilitate connection of said coupling hub with said coupling sleeve; the disconnection point between said first and second drive shaft parts being thereby provided at a location between a joint associated with a tractor with which said first drive shaft part is to be connected and said length adjusting device.

4,560,301

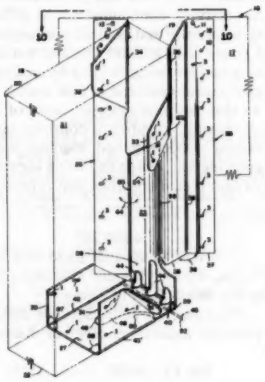
HEAVY SLOPE AND SKEW SHEET METAL HANGER AND METHOD OF MAKING SAME

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Jan. 3, 1984, Ser. No. 567,537

Int. Cl.[4] F16B *9/00*

U.S. Cl. 403—232.1 **8 Claims**



1. An asymmetrical sheetmetal slope and skew hanger connector in a frame building structure comprising:

a. a wood supporting member having a generally planar front face and right angularly related planar top face;

b. a wood supported member having a generally planar end face, generally planar side portions intersecting said end face, and a bottom edge face;

c. an elongated back plate member having a longitudinal center line axis dividing said back plate into equal transverse widths and a face adapted for parallel registration with said front face of said wood supporting member;

d. first and second side support members integrally attached to opposite sides of said back plate, formed with a plurality of fastener openings and adapted for connection to said face of said supporting member and said first side support member having a width less than the width of said second side support member;

e. a seat base integrally connected to an end of said back plate along a transverse seat bend line and extending angularly therefrom a selected distance and having a face adapted for parallel registration with said bottom edge face of said wood supported member;

f. first and second seat sides integrally connected to opposite

sides of said seat base along a first fixed seat side bend line and a second variable seat side bend line and extending generally parallel to each other and angularaly to said seat base and each formed with fastener openings at a selected distance from said seat bend line and from said seat base and adapted for connection to said side portions of said wood support member;

g. a transverse cut formed in said seat base longitudinally spaced from said transverse seat bend line and extending from said second seat side and intersecting said variable seat bend line permitting said hanger to hold a wood supported member having a width less than said transverse seat bend line; and

h. a first tab member formed from said back plate member, connected to said first side support member along a variable first tab bend line adjacent said back member and a second tab member formed from said back plate member and said second side support member and connected to a portion of said second side support member along a second tab bend line and both of said tab members extending generally parallel to each other and angularly to said back member and each formed with fastener openings at selected distances from said back plate and adapted for connection to said side portions of said wood supported member.

4,560,302

DRAINING DITCH FOR DRAINING OF ROADWAYS

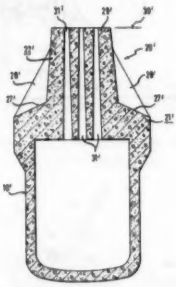
Peter Karbstein, Dätgen, Fed. Rep. of Germany, assignor to ACO Severin Ahlmann GmbH & Co. KG, Rendsburg, Fed. Rep. of Germany

Continuation of Ser. No. 491,842, Mar. 5, 1983, abandoned. This application Dec. 12, 1984, Ser. No. 681,063

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3217001

Int. Cl.⁴ E01C *11/22*; **E01F** *5/00*

U.S. Cl. 404—4 **17 Claims**



1. A draining ditch for draining of a roadway, comprising a ditch body portion which is U-shaped in cross-section and is adapted for being embedded in said roadway and a cover body portion covering the upper surface of the ditch body portion, said cover body portion having a plurality of water inlet openings, said cover body portion having an abrasion resistance equal to or less than that of the roadway surface and said cover body portion having a thickness which is at least half of the width of said ditch body portion said cover body portion being adapted to be embedded into the said roadway.

4,560,303

APPARATUS FOR FORMING CROSS COUNTRY SKIING TRACKS IN A SNOW COVERED SURFACE

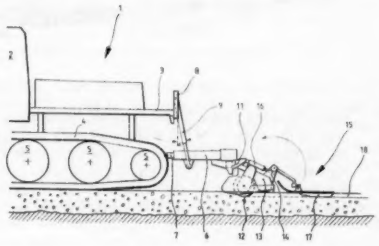
Walter Haug, Blaustein, Fed. Rep. of Germany, and Hans D. Zambelli, Salzburg, Austria, assignors to Karl Kassbohrer Fahrzeugwerke BmbH, Ulm, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,427

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247971

Int. Cl.⁴ E01C *19/22*

U.S. Cl. 404—118 **3 Claims**



1. Apparatus for forming cross country skiing tracks in a snow covered surface, said apparatus being adapted to be towed behind a vehicle and comprising in combination:

a trailer frame;

universal coupling means for connecting said trailer frame to said vehicle, said universal coupling means being of a type which permits said frame to pivot relative to the vehicle in the horizontal plane about a vertical axis as well as in the vertical plane about a first horizontal axis;

a blade assembly mounted on said frame for pivotal movement solely in the vertical plane about a second horizontal axis located rearwardly of said first horizontal axis, said blade assembly being adapted to contact and recondition the snow covered surface;

a ski track device mounted on said blade assembly for pivotal movement solely in the vertical plane about a third horizontal axis located rearwardly of said second horizontal axis, said ski track device being adapted to form skiing tracks in the snow covered surface reconditioned by said blade assembly;

first operating means for pivotally adjusting said frame about said first horizontal axis between a substantially horizontal position at which said blade assembly and said ski track device are fully extended rearwardly and operatively positioned in contact with the snow covered surface, and an upwardly inclined position at which the combination of said blade assembly and said ski track device is pivoted forwardly about said second horizontal axis and elevated above the snow covered surface; and

second operating means for pivotally adjusting said ski track device about said third horizontal axis between its operative position and a stowed position above said blade assembly.

4,560,304

METHOD AND APPARATUS FOR IMPEDING SEDIMENT DEPOSITION IN HARBORS AND NAVIGATION CHANNELS

Scott A. Jenkins, San Diego, and Joseph B. Sparks, Vacaville, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 14, 1983, Ser. No. 513,865

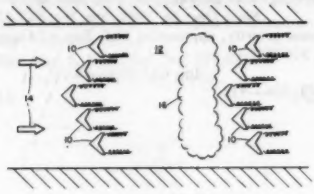
Int. Cl.⁴ E02B *8/02*

U.S. Cl. 405—74 **38 Claims**

1. A method of impeding deposition of suspended sediments onto the bottom of a waterway having a current, comprising the steps of:

passively generating a turbulent wake adjacent the bottom of the waterway; and

passively generating a net vertical deflection of the current adjacent the turbulent wake wherein the turbulent wake and net vertical deflection of the current are generated by



water flowing past a hydrodynamic body anchored adjacent to the bottom of the waterway such that the generating turbulent wake and net vertical deflection of the current will substantially prevent the sediments from depositing on the bottom of the waterway for a predetermined distance downstream of the hydrodynamic body.

4,560,305

YIELDABLE CONNECTION

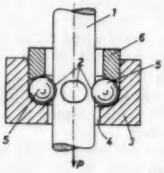
Franz Powondra, Beethovengasse 4, A-1090 Vienna, Austria

Filed Dec. 12, 1983, Ser. No. 560,552

Claims priority, application Austria, Dec. 13, 1982, 4523/82

Int. Cl.[4] E21D *20/00*

U.S. Cl. 405—259 **10 Claims**



1. Process for attaining a yieldable connection between a metallic rod-shaped body and a holding means through which it passes, which comprises: forming recesses in the periphery of the rod-shaped body; fitting between the rod-shaped body and the holding means shear bodies which project into the recesses in the rod-shaped body; and causing relative longitudinal movement between the holding means and the rod-shaped body which on sliding of the latter in the holding means form grooves in the rod-shaped body.

4,560,306

COAL FACE SUPPORT

Raymond G. Murfitt, Chorley, England, assignor to Dobson Park Industries Limited, Nottingham, England

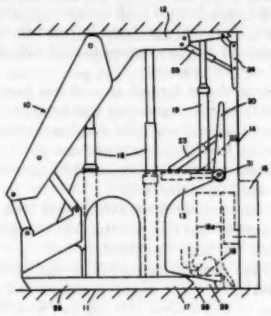
Continuation of Ser. No. 204,683, Nov. 5, 1980, abandoned. This application Apr. 5, 1983, Ser. No. 482,373

Claims priority, application United Kingdom, Nov. 9, 1979, 7938879

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—295 **17 Claims**

1. A mine roof support comprising at least one elongated base member adapted to engage the floor of a mine, a beam engageable with the mine floor and being shiftable longitudinally of said base member, an abutment at one end of the beam and movable therewith relative to said base member, and means for advancing the base member relative to the beam comprising single acting ram means adapted to lift said base member relative to said beam with the beam in engagement with the mine floor, and displacement means adapted upon actuation in an appropriate sense to move said base member longitudinally of said beam when so lifted, the displacement means being operable to move the beam longitudinally of the



base member when the base member and beam engage the mine floor.

4,560,307

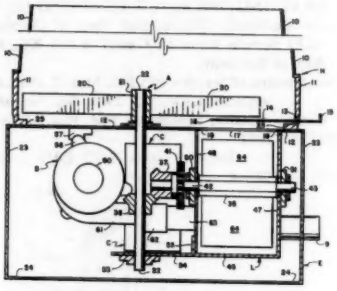
INSULATION BLOWER

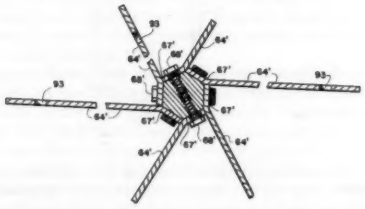
Rex R. Deitesfeld, Broomfield, Colo., assignor to Insulation Technology Corporation, Westminster, Colo.

Continuation of Ser. No. 407,041, Aug. 11, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 683,340

Int. Cl.[4] B65G *53/46*

U.S. Cl. 406—63 **19 Claims**





1. In an airlock having a housing for receiving insulation through an upper inlet for insulation and a rotor within said housing including a series of circumferential spaced vanes providing a series of spaces for moving insulation from said upper inlet to a lower position, generally sealed from said inlet and at which air is introduced into successive spaces for mov-

ing said insulation through an outlet generally opposed to said air inlet, the improvement comprising:

a shaft having a number of sides corresponding to the number of vanes;

each said vane including a blade having a flange extending at an obtuse angle to the remainder of said blade;

means for removably attaching a flange of each said blade to a side of said shaft; and

each said vane being removable through said upper inlet after detachment from said shaft.

5. A transportable insulation blower comprising:

a generally cylindrical hopper having a generally vertical axis;

a partition providing a circular bottom for said hopper;

an enclosure wall beneath said partition formed essentially as an extension of said hopper;

an agitator in said hopper comprising a series of blades extending radially from an upright shaft which extends upwardly through said partition;

a hopper outlet opening in said partition;

insulation receiving and moving means within said enclosure wall, having a horizontal drive shaft and positioned beneath said partition for receiving insulation passing through said opening and moving said insulation into a discharge conduit extending through said enclosure wall, said receiving and moving means having an air inlet opposite said discharge conduit and said inlet and conduit being laterally offset from a vertical plane through the center of said drive shaft;

means within said enclosure wall for supplying air to said air inlet of said insulation receiving and moving means;

means within said enclosure wall for driving said air supplying means;

means substantially within said enclosure wall for driving one of said agitator shaft and said shaft of said insulation receiving and moving means; and

means within said enclosure for driving the other of said agitator shaft and said shaft of said insulation receiving and moving means from the shaft driven by said driving means.

4,560,308

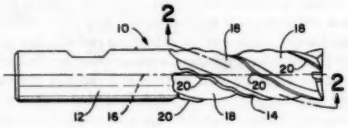
CUTTING TOOL

David L. Deller, Troy, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 13, 1984, Ser. No. 640,279

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—53 **11 Claims**



1. In an end mill of the type comprising an elongated generally cylindrical body having a central axis, a shank, and a cutting end including a plurality of generally helically extending cutting edges located a uniform radial distance from said central axis the improvement wherein at least one of said cutting edges has a generally sinusoidal configuration and a cutting face with alternating portions of positive and negative radial rake.

4,560,309

TWO TOOTH TAPERED REAMER

Carlton R. Hornsby, Longview, Tex., assignor to The Oilgear Company, Milwaukee, Wis.

Filed Jan. 25, 1983, Ser. No. 460,815

Int. Cl.[4] B23B *51/00*

U.S. Cl. 408—229 **1 Claim**

1. A finishing taper reamer, adapted to be power driven, is tapered along its shank or working portion for finish reaming a tapered hole of corresponding taper in a metal work product; said reamer presenting cylindrical cross-sections tapering, with respect to a longitudinal axis, of five degrees or less, only two diametrically opposite teeth each having a narrow flat top surface,; each tooth being followed, with respect to a direction of rotation of said reamer, by a flat relief surface having a relief or clearance angle of approximately 33 degrees, said flat relief surface extending in a circumferential direction to a circumferential bearing surface located intermediate said teeth; said bearing surfaces providing a substantial portion of the circumference of said reamer, are substantially opposite each other, and have a diameter that is less than 0.0008 inch smaller than the diameter between the cutting edges of said teeth; said bearing surfaces are each followed by a flute extending to the next said tooth to define for the tooth a negative rake angle of approximately 10 degrees.

4,560,310

TOOL HOLDER FOR BORING, MILLING AND THE LIKE MACHINE TOOLS

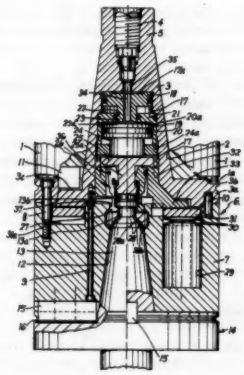
Rolf Eckstein, Rödental-Fischbach, and Ralf Dechert, Grub am Forst, both of Fed. Rep. of Germany, assignors to Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,903

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306823

Int. Cl.[4] B23C *9/00*

U.S. Cl. 409—233 **8 Claims**



1. A tool holder for boring, milling and the like machine tools, comprising a spindle, a conical shaft which fits into a first conical receiving bore in the spindle, a support member ar-

ranged coaxially on the conical shaft and having a second conical receiving bore for receiving the conical shaft of a tool, said second conical receiving bore being coaxial with the conical shaft, said second conical receiving bore being smaller than the spindle-receiving bore, a clamping mechanism for clamping of the tool conical shaft in the second conical receiving bore, the clamping mechanism comprising a coaxial hole in the tool holder conical shaft, a collet carrier with a collet axially movable in said coaxial hole, the ends of said collet being constructed as claws engageable with an annular groove at the free end of the tool conical shaft, the support member containing several axially acting cup-spring packages concentric with the second conical receiving bore, thrust means including several radially extending support arms actuable for causing clamping by the collet carrier to hold the tool conical shaft, at least one piston provided in the bore of the tool holder conical shaft and loadable by pressure medium for acting on the collet carrier in opposition to the spring pressure for releasing the collet and ejecting of the tool conical shaft.

4,560,311

EXPANSION DOWEL ASSEMBLY

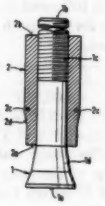
Armin Herb, Peissenberg, and Peter Froehlich, Neuried, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 8, 1983, Ser. No. 559,204

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3246275

Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—44 **4 Claims**



1. Expansion dowel assembly for insertion into a borehole or similar opening, comprising an axially elongated dowel having a leading end and a trailing end spaced apart in the axial direction with the leading end adapted to be inserted first into the borehole, connecting means for making a connection to said dowel, an expansion member disposed in surface contact with said dowel and arranged to be displaced in the axial direction of said dowel relative to said dowel, wherein the improvement comprises that said dowel has an axially extending surface thereon arranged for sliding contact with said expansion member so that the axial movement of said expansion member on said surface effects the displacement of said expansion member into an expanded position of said dowel assembly, said surface on said dowel having a first axially extending section with a first end closer to said trailing end and a second end closer to said leading end, and a second axially extending section with a first end adjoining the second end of said first axially extending section and a second end located closer to said leading end of said dowel, said first and second axially extending sections disposed at an acute angle to the axis of said dowel with said second axially extending section forming a larger angle than said first axially extending section, said expansion member is formed with an increasing cross-section from its leading end to its trailing end, said dowel has an axially extending frusto-conical section adjacent the leading end thereof with said frusto-conical section forming said first and second axially extending sections of said axially extending surface, said dowel includes an axially extending cylindrically shaped section extending from said frusto-conical section toward the trailing end of said dowel, said expansion member comprises a sleeve encircling said cylindrically shaped section when said dowel assembly is inserted into a borehole and said sleeve being axially displaceable over said frusto-conical section when said dowel assembly is placed into the expanded position, said sleeve forming said expansion member has a leading end and a trailing end spaced axially apart and in the assembled position of said expansion member on said dowel said leading end of said expansion member is closer to the leading end of said dowel and the trailing end of said expansion member is closer to the trailing end of said dowel, said sleeve has an axially extending cylindrically shaped smaller diameter outside surface extending from said leading end than the diameter of the cylindrically shaped outside surface of said sleeve extending from said trailing end, an axially extending transition surface on the outside surface of said sleeve extending between the smaller diameter leading end outside surface to the larger diameter trailing end outside surface, and the larger diameter trailing end outside surface being at least equal to the diameter of the leading end of said dowel with the inside surface of said sleeve being cylindrically shaped between the leading end and trailing end thereof with an inside diameter corresponding to said cylindrically shaped section of said dowel so that said dowel assembly can be inserted into a borehole with the leading end of said dowel contacting the base of the borehole whereby said sleeve can be driven toward the leading end of said dowel over said frusto-conical section of said dowel into radially expanded engagement with the surface of said borehole.

4,560,312

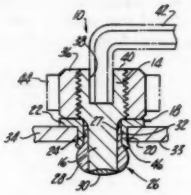
STUD AND SCREW RIVET FASTENER

James H. Grady, 10788 Highland Rd., Milford, Mich. 48042

Continuation of Ser. No. 182,667, Aug. 29, 1980, which is a continuation-in-part of Ser. No. 884,650, Mar. 8, 1978, abandoned. This application Feb. 11, 1983, Ser. No. 465,875

Int. Cl.[4] F16B *15/04*

U.S. Cl. 411—55 **20 Claims**



1. A stud and screw rivet fastener comprising: an elongated shank having external threads adjacent one end, a central portion with a diameter reduced with respect to the maximum diameter of said threads, and a head adjacent its other end enlarged with respect to said central portion; a continuous, uninterrupted tubular sleeve of a malleable material received on said central portion of said shank; a continuous, uninterrupted washer permanently received on said central portion of said shank between said tubular sleeve and said threaded portion of said shank, said washer extending radially inward of the outer periphery of said tubular sleeve to overlap the end of said tubular sleeve adjacent said washer and radially outwardly of both said tubular sleeve and said threaded portion of said shank; means permanently retaining said washer and said tubular sleeve on said central portion, said means permanently retaining comprising either forming said enlarged head on said shank or forming said threaded portion on said shank after said washer and said tubular sleeve are reeived on said central portion so that said washer and tubular sleeve are entrapped on said central portion between said enlarged head and said threaded portion of said shank; the outside diameters of said tubular sleeve, and said enlarged head of said shank being generally the same; a nut for threadily engaging the threaded portion of said shank; and restraining means adjacent one end

of said shank and adjacent, generally coaxial with and generally radially inwardly of said threaded portion for restraining said shank when rotating said nut on said threaded portion of said shank such that upon insertion of said tubular sleeve into a hole in a workpiece, and tightening of said nut while restraining said shank, said enlarged head of said shank engages and generally radially outwardly permanently deforms a portion of the sleeve adjacent said enlarged head to nondetachably secure the fastener without breaking said shank and to clamp the workpiece between said washer and said deformed portion of said sleeve.

4,560,313

CONTAINERS

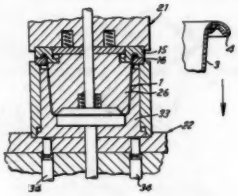
Cyril A. Bull, Mansfield, England, assignor to Metal Box p.l.c., England

Division of Ser. No. 416,039, Sep. 8, 1981, Pat. No. 4,513,872. This application Feb. 7, 1985, Ser. No. 699,245

Claims priority, application United Kingdom, Nov. 19, 1981, 8134933

Int. Cl.⁴ B21D *51/00*

U.S. Cl. 413—1 **7 Claims**



1. A method of reforming an external curl on a tubular side wall of a container body, said method comprising the steps of engaging a first die with an upper surface of the curl so that a groove in the die prevents lateral spread of the curl, and applying a second die to an underneath surface of the curl so that relative motion, in a direction parallel to the axis of the body, as between the first and second dies imposes a crushing force to create a reformed curl having a first annulus of arcuate cross section extending outwardly in a lateral direction from the side wall to define a convex external surface; a folded portion turning radially inwards from the outer periphery of the first annulus, and a second annulus extending radially inwards from the folded portion so that a convex surface of the second annulus extends adjacent to a concave inner surface of the first annulus and a marginal edge portion of the second annulus extends between the convex surface of the second annulus and the concave surface of the first annulus.

4,560,314

MAGAZINE ARRANGEMENT FOR MEASURING AND/OR SAMPLING PROBES

Johann Fohler, Puchenau, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

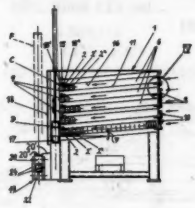
Filed Dec. 1, 1983, Ser. No. 557,352

Claims priority, application Austria, Dec. 9, 1982, 4473/82

Int. Cl.⁴ C21C *5/30*; B65G *1/08*

U.S. Cl. 414—276 **5 Claims**

1. In a magazine for measuring and/or sampling probes for use in a steel works or the like, of the type including compartments for storing said probes in a horizontal position, supply and delivery openings arranged parallel to said probes, conveying means arranged at said delivery openings, and erecting means adapted to place said probes into a vertical position when said probes are delivered to said erecting means by said conveying means, the improvement comprising a plurality of superposed storage compartments constituting a magazine, said superposed storage compartments having vertically superposed delivery openings at one end of said magazine, said storage compartments being inclined to allow said probes to roll from said supply openings towards said delivery openings, and a lift passing by said vertically superposed delivery openings and adapted to receive one of said plurality of probes from



any one of said plurality of storage compartments, said lift being movable from one of said delivery openings to said erecting means to convey a probe thereto.

4,560,315

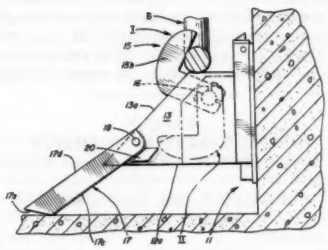
VEHICLE RESTRAINT

Norbert Hahn, South Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Jul. 11, 1984, Ser. No. 629,685

Int. Cl.⁴ B65G *69/22*

U.S. Cl. 414—401 **9 Claims**



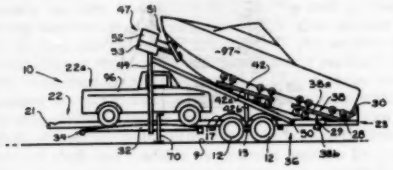
1. In a vehicle restraint for securing a vehicle parked on a roadway to an adjacent wall of loading dock wherein the restraint has a carriage member mounted for vertical movement on the dock wall and being biased to assume a predetermined elevated rest position relative to the roadway, the carriage member being moveable vertically downwardly from the rest position upon an external force of a predetermined magnitude being exerted on an exposed cam surface of the carriage member, and an attaching member mounted on the carriage member for movement relative thereto between a vehicle locking mode and a vehicle release mode; the improvement comprising means adjustably mounted on said carriage member and normally assuming a pendent relative position wherein an exposed portion thereof forms an extension of the carriage member cam surface; said means being moveable independently of said carriage member from the normal pendent position by a reactive force exerted thereon by a portion of the roadway upon the carriage member being moveable vertically downwardly beyond a predetermined distance from the rest position.

4,560,316

BOAT AND MOTOR VEHICLE TRAILER

Lewis D. Daniels, E. 14 - 6th, Spokane, Wash. 99204

Filed Mar. 1, 1984, Ser. No. 585,001
Int. Cl.[4] B60P *3/06*
U.S. Cl. 414—481 **9 Claims**



1. A dual load trailer for simultaneously carrying a boat and a wheeled motor vehicle, comprising:

a plurality of wheel means rotatably mounted upon a wheel carriage for rolling motion over a supporting surface;

a trailer frame having a front end and rear end, said trailer frame having a hitch means connected at the front end for attaching the trailer to a towing vehicle, said trailer frame further including at least two longitudinal side rails connected thereto in spaced relationship by a plurality of cross members, said longitudinal rails being approximately parallel over parallel portions thereof;

trailer frame position adjustment means for adjustably connecting the trailer frame to the wheel carriage at various relative longitudinal positions to adjust loading of the trailer with respect to the wheel carriage;

vehicle ramp means mounted upon the trailer frame for allowing a wheeled vehicle to be driven thereonto from the front end of the trailer frame; and

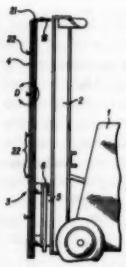
an inclined hull supporting means connected to the trailer frame and extending upwardly over rearward portions of said vehicle ramp means and sloping downwardly toward the rear end of the trailer frame and having a plurality of roller assemblies connected thereto for supporting a boat hull thereon in an inclined position and for allowing the boat hull to be launched from the rear of the trailer frame.

4,560,317

CRATE CARRYING APPARATUS

Robert N. Kellett, P.O. Box 214, Glenorchy, Tasmania, 7010, Australia

Filed Oct. 27, 1983, Ser. No. 545,847
Int. Cl.[4] B66F *9/18*
U.S. Cl. 414—672 **9 Claims**



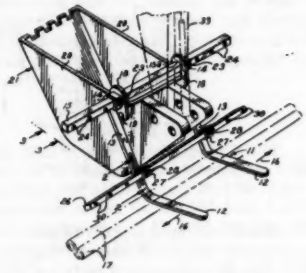
1. Crate carrying apparatus comprising a support carried by or adapted to be mounted to a truck lifting means, a first group of crate engaging means mounted on the support and each adapted to enter into a carrying aperture in a crate of a first class of crate, individual engaging means of the first group of crate engaging means being spaced apart an amount related to the spacing apart of the apertures in the crates of a stack of crates of the first class of crates, a second group of crate engaging means mounted on the support and each adapted to enter into a carrying aperture in a crate of a second class of crates, individual crate engaging means of the second group of crate engaging means being spaced apart an amount related to the spacing apart of the apertures in the crates of a stack of crates of the second class of crates and means for enabling one or the other of the first and second groups of crates engaging means to be selectively presented for crate lifting.

4,560,318

BACK HOE FORK LIFTING DEVICE

Charles F. Rodgers, and Herman R. Rodgers, both of 9007 Noroad, Jacksonville, Fla. 32210

Filed Mar. 7, 1984, Ser. No. 587,054
Int. Cl.[4] B66F *9/12*
U.S. Cl. 414—724 **1 Claim**



1. A back hoe fork lifting device, comprising, a pair of mounting arms, for securing said device to a back hoe vehicle, a pair of fork arms received on said pair of mounting arms, a bar received on said pair of fork arms, a pair of channel clamps freely received on said bar, and an opening through said pair of channel clamps freely receives a bolt fastener, and said bolt fastener is one of a pair, and a plurality of equally spaced transverse openings through said bar receives each said bolt fastener, selectively, for adjustment spread of said pair of fork arms from each other, and each said bolt fastener is also freely received in an elongated cut-out opening through said pair of fork arms and provides adjustment means for elevating and lowering said bar on said pair of fork arms, and each said bolt fastener locks said bar at any desired elevation on said pair of fork arms, by a nut fastener received on each said bolt fastener.

4,560,319

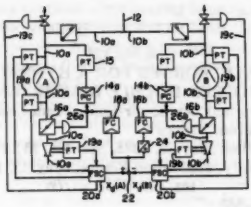
METHOD AND APPARATUS FOR CONTROLLING AT LEAST TWO PARALLEL-CONNECTED TURBOCOMPRESSORS

Wilfried Blotenberg, Oberhausen, Fed. Rep. of Germany, assignor to MAN Maschinenfabrik Unternehmensbereich GHH Sterkrade, Oberhausen, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 519,097
Int. Cl.[4] F04D *27/02*
U.S. Cl. 415—1 **13 Claims**

1. A method of operating at least two parallel-connected, controllably-adjustable turbocompressors each having a blow-off or blowdown valve for opening before a pumping limit is reached at a blowoff line extending parallel to the pumping limit for the prevention of surge, comprising: controlling the turbocompressors jointly by load-distribution controllers and

individually by pressure controllers, the load-distribution controllers adjusting the individual turbocompressors in such a



way that the spacing of the operating point from the blowoff line is the same for each of them.

4,560,320

VENTILATING UNIT

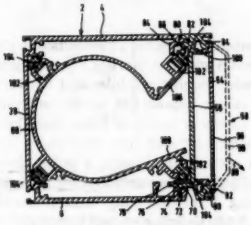
Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach/-Thun, Switzerland

Continuation of Ser. No. 456,500, Jan. 7, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 701,805

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1982, 3200210

Int. Cl.[4] F24F *13/10*

U.S. Cl. 415—118 **20 Claims**



1. A ventilating unit comprising:

a housing having walls forming a substantially U-shaped cross-section with an open face and defining an interior space having a longitudinal axis;

an inspection-flap pivotably mounted on a longitudinal edge of said housing and extending substantially over the entire length of said housing for closing the open face of said housing, said inspection-flap being provided with an airway opening and with an actuating element opening therethrough;

locking means for securing said pivotably mounted inspection-flap to said housing in a position to close the open face of said housing;

a cover-flap pivotably mounted on a longitudinal edge of said inspection-flap for selectively covering and uncovering said inspection-flap and airway opening;

an actuating element extending through said actuating element opening in said inspection-flap and operatively connected with said cover-flap to selectively pivot said cover-flap;

at least one transverse retaining wall arranged in the interior of said housing; and

a fan-housing disposed in said interior space and containing a fan for moving air through said airway opening, said fan-housing being slidable through the open face of said housing when said inspection-flap is opened;

said fan-housing being provided on its exterior with four resilient support elements which engage corners of the ventilating unit housing and the inspection-flap when said inspection-flap is closed such that said fan-housing is firmly supported in the interior space of said housing by said resilient support elements when said inspection-flap is closed whereby rotation of said fan-housing around said longitudinal axis is prevented and secured in said interior space when said locking means are secured.

4,560,321

CEILING FAN

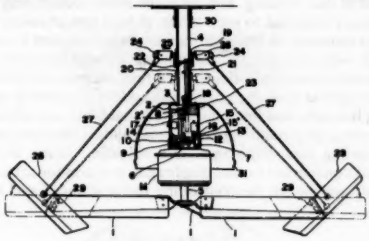
Yuzo Kawai, Nara, Japan, assignor to Kabushiki Kaisha Suiden, Osaka, Japan

Filed Sep. 26, 1984, Ser. No. 654,570

Claims priority, application Japan, Sep. 26, 1983, 58-179837

Int. Cl.[4] F04D *29/36*

U.S. Cl. 416—23 **4 Claims**



1. A ceiling fan comprising:

a main vane connected to a driving means through a shaft;

an auxiliary vane pivotally connected to a terminating end of the main vane;

a supporting means for suspending the fan from a ceiling, wherein the supporting means includes a casing;

a bracket unit slidably provided on the supporting means;

a rod member connecting between the auxiliary vane and the bracket unit;

a clutch means for effecting the connection and disconnection between the bracket unit and the driving means, the clutch means being accommodated in the casing; and

a switch means for effecting the engagement and disengagement of the clutch means with the driving means.

4,560,322

REGULATOR FOR REGULATING THE OUTPUT PRESSURE OF A MOTOR DRIVEN PUMP

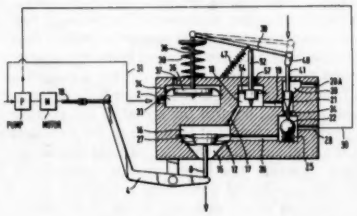
Ulf Andersson, Ladugardsvägen 6, 44 06 Grabo, Sweden

PCT No. PCT/SE82/00169, & 371 Date Jan. 12, 1984, & 102(e) Date Jan. 12, 1984, PCT PUB. No. WO 83/04074, PCT Date Nov. 24, 1983

This PCT filed Jan. 12, 1984, Ser. No. 573,936

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—26 **10 Claims**



1. A regulator for regulating the output pressure of a pump which has a suction side and a pressure side and is operatively connected to a motor for driving the pump, said regulator comprising: a housing, means movably arranged in said housing and operatively connected to said motor for controlling said motor which is driving said pump in accordance with the

amount of movement of said movable means in said housing, a passage in said housing located between a duct for connection to the pressure side of the pump and discharge opening to atmosphere, first and second valve means movably arranged in said passage for co-operation with each other and for sensing the output pressure from the pump, one of said first and second valve means being arranged in said passage to control the communication of said passage with the surrounding air so as to always allow at least a small quantity of fluid to flow from said duct via said discharge opening, a second passage extending from said duct to said movable means, whereby increased or decreased output from said pump brings about a displacement of said movable means to a maximum or minimum position in said housing, said movable means comprising two elements connected to each other, at least one chamber between said elements, at least one element being adapted to communicate with atmosphere, at least one of said elements being in pressure communication with a first chamber communicating with said at least one chamber, a middle chamber in said housing between said first chamber and said first and second valve means, a diaphragm separating said middle chamber, means for actuating said diaphragm, said actuating means including a shaft connnected to said diaphragm, and arm for actuating said shaft, and means for controlling the position of said arm.

4,560,323

APPARATUS FOR CONTROLLING THE FLOW OF A FLUID

William R. H. Orchard, 3 North View, Wimbledon Common, London SW19, England

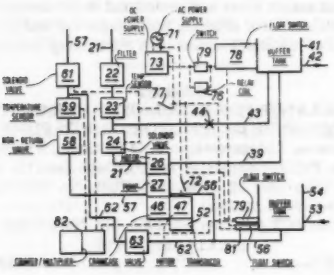
PCT No. PCT/GB81/00085, § 371 Date Jan. 13, 1982, § 102(e) Date Jan. 13, 1982, PCT Pub. No. WO81/03361, PCT Pub. Date Nov. 26, 1981

PCT Filed May 13, 1981, Ser. No. 346,064

Claims priority, application United Kingdom, May 13, 1980, 8015756

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—27 **4 Claims**



1. Apparatus for controlling the flow of a fluid from a fluid supply at a supply pressure, including a first positive displacement device connected to the fluid supply to deliver fluid to a load at a specific load pressure different from the supply pressure, a second positive displacement device arranged to receive fluid from the load and to deliver the fluid at the supply pressure, and means to control the speed of the positive displacement devices to control at least one of the parameters of the fluid in the load including the flow of fluid therein and the load pressure, wherein the improvements comprise a first buffer container capable of containing a variable volume of said fluid connected to the delivery of the first positive displacement device, and a second buffer container capable of containing a variable volume of said fluid connected to the input of the second positive displacement device to receive fluid from the load, and wherein the control means constrain the movable members of the positive displacement devices to operate, in use, at a single, constant speed and means are provided which control the passage of fluid through the apparatus, in use, by alternation between keeping the movable members stationary and allowing them to operate at said constant speed.

4,560,324

AUTOMATIC PURGER FOR A HYDRAULICALLY CONTROLLED DOUBLE DIAPHRAGM PUMP

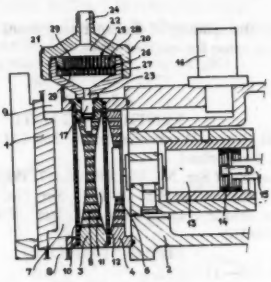
Francois P. Durieux, Aurec-sur-Loire, France, assignor to Clextral, Courbevoie, France

Filed May 23, 1985, Ser. No. 737,975

Claims priority, application France, May 25, 1984, 84 08222

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—383 **5 Claims**



1. An automatic purger for a hydraulically controlled double diaphragm pump which comprises a pumping chamber defined by a first elastic diaphragm, inlet and delivery conduits provided with valves, connected to the pumping chamber, an intermediate chamber which is filled with fluid and is defined by a wall formed by said first diaphragm and another wall formed by a second diaphragm, a pulse chamber also filled with fluid and a piston movably mounted in said pulse chamber for undergoing a reciprocating motion therein, said purger comprising a body defining a small enclosure which communicates with said intermediate chamber and encloses an element highly permeable to the gas.

4,560,325

BEARING SUPPORT FOR TURBOCHARGERS

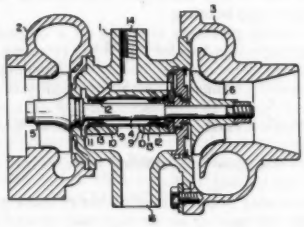
Masahiro Yoshioka; Muneo Mizumoto, both of Ibaraki, and Koichiro Yamada, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,874

Claims priority, application Japan, Jan. 6, 1982, 57-320

Int. Cl.[4] F04B *17/00*; F16C *19/55*

U.S. Cl. 417—407 **4 Claims**



1. A turbocharger comprising a rotor shaft, a pair of floating bush means for supporting said rotor shaft by portions of a bearing housing disposed in opposition to the floating bush means, a pair of holder means replaceably attached to inner

peripheral surface portions of the bearing housing opposed by outer peripheral surfaces of said floating bush means, first securing means for securing said holder means to the inner peripheral surface portions of the bearing housing, said floating bush means being rotatably disposed on inner peripheral surfaces of the respective holder means, and second securing means for securing said floating bush means in a predetermined position relative to said holder means, wherein said pair of holder means respectively include first ends and second ends, said holder means replaceably disposed in said portions of said bearing housing with the first ends thereof in abutment with each other, and wherein said first securing means includes snap ring means for respectively securing the second ends of said holder means to the portions of said bearing housing.

4,560,326

DIAPHRAGM TYPE PUMP DEVICE

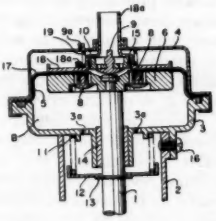
Kimiaki Seki, Kasai, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,158

Claims priority, application Japan, Oct. 28, 1983, 58-167708[U]

Int. Cl.⁴ F04B *43/00*

U.S. Cl. 417—480 **2 Claims**



1. A diaphragm type pump device comprising:
a casing having a cover;
a diaphragm dividing an interior of said casing into a suction chamber and a discharge chamber;
a movable plate fixed to said diaphragm and having a discharge valve communicating said suction and discharge chambers;
a slide shaft fixed to said movable plate for reciprocating said movable plate and said diaphragm, whereby said diaphragm can move to a minimum suction chamber size position;
a head plate movable positioned in said suction chamber independently of said movable plate, and including an inlet valve; and
a rubber sheet in and defining a portion of said suction chamber, said rubber sheet having a circumferential part clamped by said casing and said cover and a central part fixed to said head plate, wherein said rubber sheet is shaped so as to come in close surface contact with said diaphragm when said diaphragm moves to said minimum suction chamber size position, whereby fluid does not remain between said diaphragm and said rubber sheet.

4,560,327

PORTING AND DUCTING ARRANGEMENT

Eckhard Bez, Moorabbin, and John L. Farrant, North Balwyn, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

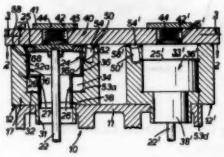
Filed Dec. 16, 1983, Ser. No. 561,869

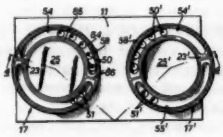
Claims priority, application Australia, Dec. 17, 1982, PF7323

Int. Cl.⁴ F04B *37/14*

U.S. Cl. 417—493 **15 Claims**

1. A porting and ducting arrangement for a pair of adjacent hollow cylinders comprising:
a pair of adjacent hollow cylinders;
respective pluralities of passages extending longitudinally in the walls of the cylinders;
respective ports communicating the passages with the interiors of the cylinders;
a cover for the cylinders;
plural recesses each in communication with a separate one of said passages or group of said passages when the cover is applied to the cylinders with a pair of said recesses being associated with each cylinder and duct means in the cover communicating at least one recess of each pair with a recess of the other pair; and





gasket means for retention between the cylinders and the cover to seal each recess of each said pair of recesses with respect to the other recess of the pair.

15. A porting and ducting arrangement according to claim 1, provided for each of two pairs of hollow cylinders in a four-cylinder vacuum pump, wherein the cylinders of one of said pairs are coupled in parallel to serve as the high vacuum stage when the pump is operating, while the other two cylinders are connected in series with each other and with the high vacuum stage and serve respectively as low and intermediate vacuum stages, one pair of said recesses in the high vaccum stage being in communication with a said recess of the intermediate stage via a duct joining respective said passages in the two stages.

4,560,328

ROTARY PISTON MACHINE HAVING A PLURALITY OF CHAMBERS CONTAINING RECIPROCATING FLAP PISTONS

Albrecht Kayser, Bergisch Gladbach 2, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V. Linder Höhe, Cologne, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,473

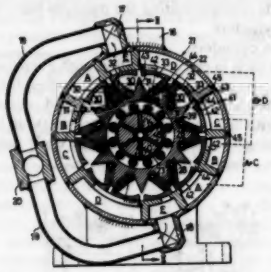
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323397

Int. Cl.⁴ F01C *1/00*

U.S. Cl. 418—8 **45 Claims**

1. A rotary piston machine operative as an expansion or compression machine comprising a stator and a rotor, said rotor being disposed in coaxial relationship to said stator, said rotor including a plurality of chambers, means for oscillatingly mounting a flap piston in each of said chambers, each of said flap pistons being connected to a flap shaft supported by said rotor, each flap piston projecting radially outwardly from its associated flap shaft means responsive to rotor rotation for oscillating each two adjacent flap pistons oppositely relative to each other through said flap shafts, said stator including inlet/-outlet chambers around its circumference, stator openings associated with said inlet/outlet chambers, openings in an outer periphery of said rotor for selectively placing said chambers in fluid communication with said inlet/outlet chambers

through said stator openings, said stator openings having a peripheral extent larger than said rotor openings, and each flap



piston dividing its associated chamber into two separate working compartments.

4,560,329

STRAINER DEVICE FOR ROTARY COMPRESSOR

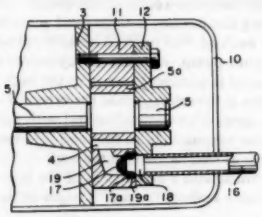
Takuho Hirahara; Fumiaki Sano, both of Shizuoka; Koji Ishijima, Fujieda; Susumu Kawaguchi, and Kazuhiro Nakane, both of Shizuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1984, Ser. No. 620,831

Claims priority, application Japan, Oct. 20, 1983, 58-196525

Int. Cl.⁴ F04C *18/00, 29/00*

U.S. Cl. 418—47 **6 Claims**



1. A strainer device for a rotary type compressor, which comprises, in combination:

a rotational shaft;

a rolling piston which rotates with rotation of said rotational shaft;

a cylinder plate provided in correspondence to the direction of the outer periphery of said rolling piston;

a pair of side plates supporting said rotational shaft, and being disposed on both side surfaces of said cylinder plate to define a compression chamber;

a shell housing;

a suction pipe passing through said shell housing with one end thereof being connected with a suction port formed in one of said side plates to introduce intake gas;

a communication path for leading said intake gas from said suction port to said compression chamber, said communication path including an enlarged diameter portion in one of said cylinder plate and said side plate, said enlarged diameter portion having one end defined by a joint between said cylinders plate and said side plate; and

a strainer for removing foreign substances contained in the intake gas, said strainer being provided in said enlarged diameter portion, said strainer having a caulking fitting larger than said communication path and fitting into said enlarged diameter portion so as to fix said strainer in position.

4,560,330

SCROLL DEVICE WITH SUCTION CHAMBER PRESSURE RELIEF

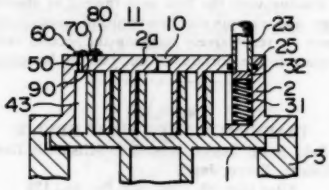
Akira Murayama; Hiroaki Kuno; Naoshi Uchikawa; Takahiro Tamura; Takao Mizuno, all of Shimizu, and Sumihisa Kotani, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,691

Claims priority, application Japan, Oct. 21, 1983, 58-195974

Int. Cl.⁴ F01C *1/04;* **F04B** *49/08*

U.S. Cl. 418—55 **10 Claims**



1. A scroll-type fluid machine comprising an orbiting scroll member and a stationary scroll member each having an end plate and a spiral wrap protruding upright from the end plate, said scroll members being assembled together such that the spiral wraps mesh with each other to define therebetween closed chambers, volumes of which progressively decrease as the closed chambers are moved toward a center of the scroll members as a result of an orbiting movement of said orbiting scroll member relative to said stationary scroll member thereby continuously drawing and discharging refrigerant gas, a fluid check valve means disposed in a refrigerant suction passage for preventing reversing of said orbiting scroll members; a passage means for communication between a refrigerant gas suction chamber defined by both scroll members and another chamber; and a pressure relieving means disposed in said communication passage means for relieving any abnormally high pressure established in said suction chamber.

4,560,331

LUBRICANT RESERVOIR

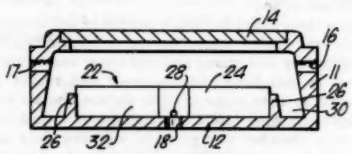
George F. Sanderson, Glasgow, Scotland, assignor to James Howden & Company Limited, Scotland

Filed Nov. 6, 1984, Ser. No. 668,651

Claims priority, application United Kingdom, Nov. 7, 1983, 8329688

Int. Cl.⁴ F04B *9/08*

U.S. Cl. 418—65 **5 Claims**



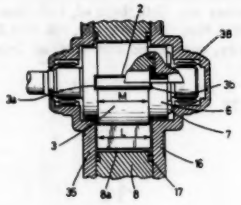
1. A reservoir for gravity feeding lubricant to a bearing, said reservoir comprising a receptacle having a peripheral wall, a lower outlet from said receptacle for the outflow of lubricant, an annular weir surrounding an inner space around said lower outlet, an inlet positioned to feed lubricant into the outer space between said peripheral wall and said annular weir and a bleed passage in said annular weir permitting a limited amount of lubricant to flow between said outer and inner spaces, a greater flow of lubricant taking place when the lubricant can pass over said weir.

4,560,332

ROTARY VANE-TYPE COMPRESSOR WITH VANES OF MORE THERMALLY EXPANSIBLE MATERIAL THAN ROTOR FOR MAINTAINING SEPARATION OF ROTOR FROM HOUSING SIDE PLATE DURING HIGH TEMPERATURE OPERATION

Masato Yokoyama, Oobu; Eiichi Nagasaku, Chiryu; Tosiki Taya, and Toshiyuki Kato, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 6, 1984, Ser. No. 617,706
Claims priority, application Japan, Jun. 8, 1983, 58-102244
Int. Cl.[4] F04C *18/00, 29/00*
U.S. Cl. 418—83 6 Claims



1. A rotary vane-type compressor, comprising:

housing means defining a closed cylindrical cavity with an inner peripheral surface and opposite ends;

means defining a refrigerant gas inlet to said cavity and a compressed refrigerant gas outlet from said cavity;

valve means interposed in said inlet and outlet for controlling flow of refrigerant gas to and from said cavity;

a rotor having an outer peripheral surface and axially opposite end surfaces, said rotor being provided in said outer peripheral surface with a plurality of radially outwardly opening slots, each of which extends from one end of the rotor to the other;

a set of vanes, each radiating from a respective said slot in said rotor and being movably mounted therein for variable radial projection outwardly of said outer peripheral surface of said rotor, each vane having a radially outer end;

a shaft journalled for rotation with respect to said housing means and sealingly extending axially into said cavity;

said rotor being eccentrically disposed in said cavity and mounted to said shaft to be rotated with said shaft with said vane ends in sliding contact with said inner peripheral surface of said cavity and dividing said cavity into a plurality of chambers;

said rotor being made of a material having a smaller coefficient of thermal expansion than that of the material of which said vanes are made;

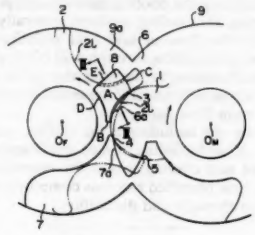
said rotor and vanes being of such corresponding dimensions, axially of said cavity, that when said rotary vane-type compressor is operating at a preselected intermediate temperature, said corresponding dimensions are substantially equal and both said vanes and said ends of said rotor are in sliding contact with said housing means at opposite ends of said cavity, but when said rotary vane-type compressor is operating at a lower temperature said vanes are gapped from said housing means at at least one of said opposite ends of said cavity so that refrigerant gas in said cavity may escape from one said chamber to another said chamber between said vanes and said at least one end of said cavity, and when said rotary vane-type compressor is operating at a higher temperature said vanes protrude sufficiently beyond said axially opposite end surfaces of said rotor as to prevent said rotor from fusing to said housing means at said opposite ends of said housing.

4,560,333

SCREW COMPRESSOR

Mitsuru Fujiwara, Ibaraki, and Taisuke Torigoe, Atsugi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,814
Int. Cl.[4] F04C *25/00*
U.S. Cl. 418—180 10 Claims



1. A screw compressor comprising a casing having two intersecting bores with parallel axes, a suction port and a discharge port communicating with said bores, respectively, and a pair of screw rotors, one male and one female, received in said bores so as to rotate in meshing relationship to suck gas from the suction port into a working space defined by said rotors and said casing, to compress the gas and then to discharge the gas through the discharge port;

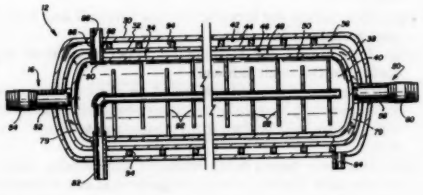
wherein the improvement comprises a discharge side end surface of said casing having a recess formed thereon so as to open in the bores, said recess having a configuration, in the plane perpendicular to the axes of said rotors, which includes a curve which conforms with a leading edge of the female rotor facing a closed working spaced formed between said rotors just as the working space is isolated from the discharge port.

4,560,334

APPARATUS FOR EXTRUDING THERMOPLASTIC COMPOSITIONS

Raleigh N. Rutledge, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 405,270, Aug. 4, 1982, abandoned, which is a division of Ser. No. 298,361, Sep. 1, 1981, Pat. No. 4,362,482, which is a continuation-in-part of Ser. No. 110,529, Jan. 9, 1980, abandoned. This application Jun. 10, 1983, Ser. No. 503,008
Int. Cl.[4] B29D *7/02;* B29F *3/08*
U.S. Cl. 425—4 C 15 Claims



1. Apparatus for extruding thermoplastic resinous compositions, comprising:

an extruder for heat plastifying the resinous composition and forwarding said resinous composition in an extrusion direction;

cooling means, positioned downstream of said extruder having an inlet communicating with an outlet port of said extruder, for cooling the heat plastified resinous composi-

tion exiting from said extruder to a uniform temperature desired for extrusion through an extrusion die, said cooling means including at least one enclosed resin flow path for conveying the heat plastified resinous composition from the inlet of said cooling means to an outlet of said cooling means;

means for circulating a cooling medium about the entire circumference of each of said resin flow paths, said means for circulating the cooling medium comprising means for circulating the cooling medium generally counter-directional to the flow of said heat plastified thermoplastic resinous composition through said cooling means;

flow control orifices at the inlet and outlet of said cooling means across substantially the entire cross section of each of said resin flow paths; and,

an extrusion die including a die orifice, positioned downstream of said cooling means communicating with the outlet of said cooling means for receiving homogenous cooled, heat plastified resinous composition therefrom for extrusion through said die orifice.

4,560,335

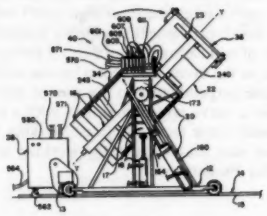
VAULT MACHINE

Elmer R. Cordova, and Jeffrey D. Cordova, both of 13200 Titan Rd. S., Littleton, Colo. 80125

Filed Nov. 7, 1983, Ser. No. 549,673

Int. Cl.⁴ B28B *7/16, 21/80;* **B29C** *5/03*

U.S. Cl. 425—62 **40 Claims**



1. A vault machine for making burial vaults of a type having a bottomwall and an integrally formed sidewall positioned substantially perpendicular to the bottomwall from a forming material having a pourable fluid state and a set solid state such as concrete or the like, the vault machine comprising:

carriage means for supporting various machine components for enabling relative movement thereof;

outer form means for forming exterior sidewall surfaces of a vault;

bottom form means fixedly engageable with said outer form means for forming an exterior bottomwall surface of a vault;

inner form means for forming interior sidewall and bottomwall surfaces of a vault;

edge form means for forming an upper peripheral edge surface of the vault sidewall;

mainframe means operably mounted on said carriage means for supporting and collectively repositioning said outer form means, said bottom form means, and said inner form means;

said mainframe means being rotatably displaceable about a substantially horizontal mainframe central axis of rotation;

said mainframe central axis of rotation being linearly displaceable relative said carriage means along a mainframe linear displacement path perpendicular said central axis of rotation;

said outer form means being linearly displaceable relative said mainframe means along an outer form linear displacement path parallel said mainframe linear displacement path;

said inner form means being linearly displaceable relative said mainframe means along an inner form linear displacement path parallel said mainframe linear displacement path;

said edge form means being linearly displaceable relative said mainframe means along an edge form linear displacement path parallel said mainframe linear displacement path.

4,560,336

APPARATUS FOR PRODUCING DRY-PRESSED MOULDING FROM A PARTICULATE OR GRANULAR MOULDING MATERIAL

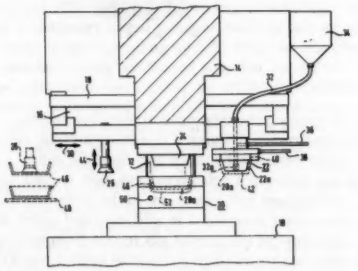
Eugen Bühler, Schleifweg 3, D-8871 Burtenbach, Fed. Rep. of Germany; Klaus Strobel, and Karl Schwarzmeier, Selb, Fed. Rep. of Germany, assignors to Eugen Bühler, Burtenbach and Hutschenreuther AG, Selb, both of, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,533

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1983, 3341959

Int. Cl.⁴ B28B *3/02, 13/02*

U.S. Cl. 425—78 **6 Claims**



1. In apparatus for producing moldings from a dry, particulate or granular material such as a ceramic molding composition, of the type comprising:

a first mold half,

a vacuum shooting head which, together with said first mold half, forms a loading cavity,

vacuum applying means for applying a vacuum to said loading cavity to draw said molding material into said loading cavity where it is precompressed to form a premolding, and

a second mold half, said second mold half being displaceable into and out of a working position in alignment with said first mold half and being movable towards said first mold half whereby to press a premolding in said first mold half to form a molding;

the improvement wherein said vacuum shooting head, said second mold half and a removal head for removing said molding from said first mold half are all carried by a single carriage, said carriage being mounted on the press head of a press so as to be displaceable transversely of the pressing direction with respect to said first mold half,

a base portion of said press carrying said first mold half such that by displacing said carriage with respect to said press head transversely of said pressing direction, said vacuum shooting head, said second mold half and said removal head are successively displaceable into alignment with said first mold half whereby, in use of said apparatus, said loading cavity can be filled and a premolding formed, and in succession, said premolding can be pressed to form a molding, and said molding can be removed from said first mold half, the arrangement being such that when said vacuum shooting head, and/or said second mold half are in alignment with said first mold half, said removal head is in a transfer position relative to a receiving surface

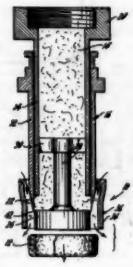
whereby to transfer a molding formed during a preceding cycle to said receiving surface.

4,560,337

HIGH-SPEED FOOD PRODUCT FORMING APPARATUS

Joseph T. Chin, Elmhurst, N.Y., assignor to DCA Food Industries, Inc., New York, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,088
Int. Cl.⁴ A21C *11/16*
U.S. Cl. 425—288 **3 Claims**



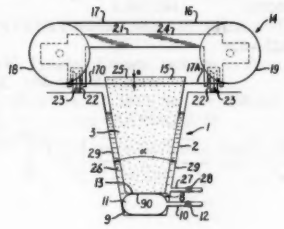
1. In a high-speed food product forming apparatus of the type which includes a nozzle having an axial bore extending longitudinally therethrough for the conduct of a slurry of said food product delivered at one, upstream, end of said nozzle to an orifice at the other, downstream, end of said nozzle, said orifice being constructed and arranged for radially outwardly discharging given amounts of said slurry, the improvement comprising a forming apparatus constructed and arranged to have radially inner and radially outer forming surfaces, said radially outer forming surface being located on a sleeve having an axis being generally aligned coaxially with the axial bore of said nozzle and being constructed and arranged in spaced-apart relationship with said orifice for forming a corresponding outer wall on the exterior of said given amounts of discharged slurry, said forming apparatus further comprising a radially inner forming surface for forming a radially inner wall on the interior of said food product, said radially inner forming surface being located on a cutter member and being located downstream of said orifice and generally aligned coaxially with the axial bore of said nozzle, means mounting said sleeve including said radially outer forming surface for movement in an axial direction relative to said orifice, said sleeve and said radially outer forming surface being constructed and arranged to continuously maintain said radially outer forming surface in confronting relation to said orifice during said axial movement, said radially inner forming surface being constructed and arranged to form the radially inner surface of said food product upon said radially outer forming surface moving axially relative thereto and discharged amounts of said foodstuff slurry likewise moving axially downstream relative thereto, said radially inner forming surface being of an axial extent at least substantially equal to the axial extent of said formed foodstuff, said radially inner and said radially outer forming surfaces being constructed and arranged to be substantially unobstructed in a direction parallel to said region axially above and below said orifice, said forming apparatus being further constructed and arranged so that said formed food product is substantially entirely contained between said radially inner and outer forming surfaces during the formation of the inner and outer walls thereof, said formed food product being unobstructed and free to be discharged from said high speed forming apparatus in said axial direction upon closing of said orifice and completion of the formation of said food product.

4,560,338

APPARATUS FOR OBTAINING STRIPS FROM A MATERIAL, PARTICULARLY FROM A LATEX COAGULUM

Robert Mioche, Nohanent, France, assignor to Compagnie Generale des Etablissements Michelin, France

Filed Nov. 29, 1983, Ser. No. 555,699
Claims priority, application France, Nov. 29, 1982, 82 20112
Int. Cl.⁴ B29C *67/06*
U.S. Cl. 425—308 **13 Claims**



1. An apparatus for obtaining strips from a material, characterized by the following features:

(a) said apparatus comprises raising means for raising the material with a fluid via a solid piece arranged below the material and placed directly in contact with the material;

(b) said raising means further comprise means for placing a liquid directly in contact with the material above the solid piece and below the solid piece in order to ascend the solid piece as a result of buoyancy;

(c) said solid piece comprises at least one inflatable bag;

(d) said apparatus comprises cutting means for cutting the material into strips above the solid piece;

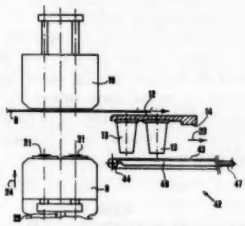
(e) said apparatus comprises means for mounting the cutting means and for displacing the cutting means along the material.

4,560,339

EXTRACTING SYSTEM FOR FABRICATED OBJECTS FORMED BY A THERMO-FORMING MACHINE

Pietro Padovani, Verona, Italy, assignor to Officine Meccaniche Veronesi SpA (O.M.V.), Parona, Italy

Filed Oct. 26, 1984, Ser. No. 665,010
Claims priority, application Italy, Nov. 15, 1983, 84977 A/83
Int. Cl.⁴ B29C *3/00*
U.S. Cl. 425—437 **14 Claims**



1. In a thermoforming apparatus of the type in which thermofored objects are formed from a sheet of synthetic material and cut in one unit, using dies with several rows of recesses containing the objects, and are thereafter removed from the unit by an extractor to a position away from the unit, wherein the improvement comprises said extractor having at least one movable plate with a supporting surface for the objects, said plate being provided with channels and holes for supplying

adjustable suction and pressure by connection to a vacuum and compressed air unit.

4,560,340

APPARATUS FOR FORMING ORIENTED CONTAINERS

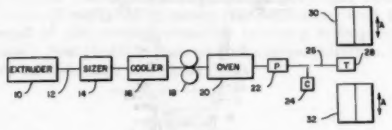
Harry A. Younkin, Newark, Del.; Gottfried Mehnert, Berlin, and Uwe V. Roos, Bodenteich-Uelzen, both of Fed. Rep. of Germany, assignors to Hercules Inc., Wilmington, Del.

Filed Jul. 15, 1980, Ser. No. 169,141

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 80102706

Int. Cl.⁴ B29C *17/07, 17/16*

U.S. Cl. 425—526 **20 Claims**



1. An apparatus for the formation of finished hollow containers of molecularly oriented plastic material from tubular parisons of orientable material heated to a suitable orientation temperature for the material, comprising:

supply means for providing along a horizontal axis a supply of tubular parisons of orientable material;

transfer means including a clamp set mounted for pivotal movement from the horizontal position and reciprocally movable horizontally within a plane disposed substantially perpendicularly to the horizontal supply axis and adapted for securing an end portion of a parison and rotating it from the horizontal position, said transfer means further including an accumulator horizontally movable in a plane parallel to the reciprocal movement of said clamp set, said accumulator receiving and positioning a parison from the supply means preparatory to being secured by said clamp set;

molding means movable between a first, molding position and a second, parison-receiving position, the rotated parison being received within said molding means with said molding means in said second position, and said molding means returning to said first position to complete formation of the container;

gripping means disposed in cooperative relation to said molding means for gripping a portion of the parison secured and rotated by said transfer means; and

means for stretching the parison to molecularly orient the parison material longitudinally prior to container formation in the molding means,

whereby the molding means receives the parison from the transfer means, the gripping means grips the free end portion of the parison, and the stretching means stretches the parison to molecularly orient the parison material longitudinally prior to intiation of formation of the container, the entire container being formed from the molecularly oriented material of the parison.

4,560,341

APPARATUS FOR TRANSPORTING SECTIONAL MOLDS

Robert X. Hafele, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Division of Ser. No. 348,730, Feb. 16, 1982, Pat. No. 4,468,368. This application May 4, 1984, Ser. No. 606,976

Int. Cl.⁴ B29C *1/14;* **B29F** *3/00*

U.S. Cl. 425—532 **6 Claims**

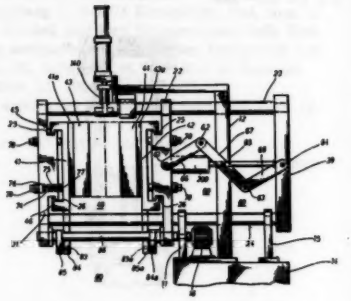
1. An apparatus for forming successively formed plastic articles, comprising:

at least first and second molding stations which are spaced generally along a first axis;

a pair of generally parallel clamping plates extending from the first to the second molding station and spaced on opposed sides of those stations, each plate including a guide surface;

a mold section mounted on the guide surface on each clamping plate such that the molding sections can move between the first and second molding stations;

reciprocal means for moving the molding sections between the first and second molding stations;



means for displacing the clamping plates toward and away from each other, so that the clamping plates can selectively open, close or clamp the molding sections; and

biasing means mounted between the mold sections and the clamping plates, so that the clamping plates may be moved sufficiently close together to close the mold sections under the biasing force of the biasing means, yet such that the mold sections may be moved from one molding station to the other while under the biasing force, whereupon the clamping plates may be placed under greater closing pressure at one or more molding stations to clamp and seal the mold sections.

4,560,342

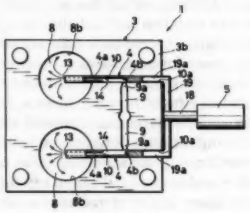
INJECTION MOLDING INSTRUMENT FOR FORMING RESIN CONCAVE LENSES

Takeshi Ishida, and Yoshihiro Ishida, both of 289, Bessho-cho, Matsubara-shi, Osaka-Pref, Japan

Filed Feb. 27, 1984, Ser. No. 583,610

Int. Cl.⁴ B29C *45/28;* **B29D** *11/00*

U.S. Cl. 425—562 **1 Claim**



1. An injection molding apparatus for forming resinous concave lenses which have outer areas thicker than intermediate center areas, comprising

at least one set of molds for forming the lenses, comprising an upper mold portion and a lower mold portion disposed opposite to said upper portion, said upper portion and said lower portion being engageable with each other, said molds having an inside molding space therebetween cor-

responding to said concave lense when said upper portion and said lower portion are aligned and engaged with each other;

a runner means disposed between said upper portion and said lower portion of said mold and providing access from an outside of said mold to said inside molding space of said mold;

a feeding slider disposed within said runner and being movable therewith, said slider comprising an upper part, a lower part engageable with said upper part, a mouth at one end thereof, and an aperture toward another end thereof, and a channel connecting said mouth and said aperture, wherein said raw material, comprising resin for forming said concave lenses, is fed under pressure into said aperture and through said channel to exit through said mouth and into said inside molding space of said molds, said upper part of said slider being associated with the upper portion of said mold and said lower part of said slider being associated with said lower portion of said mold, and said upper part of said slider being movable away from engagement with said lower part when said upper portion of said mold is moved away from engagement with said lower portion of said mold, thereby to enable ready access for removal of molded lenses from said mold;

driving means comprising rod means for initially moving said slider along said runner to locate said mouth of said slider within said molding space at substantially the center thereof whereat the distance between the upper portion of the mold and the lower portion of the mold is thinner than at the outer periphery of said molding space; and

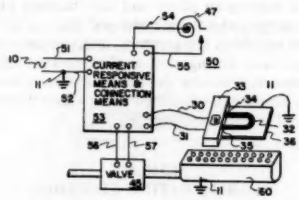
means for feeding said raw material under pressure into said aperture and through said channel and to exit through said mouth of said slider into said center of said molding space initially and thereafter said slider moves toward the periphery of said molding space as said raw material under pressure fills up said molding space starting at said center and extending radially outward to said periphery of said molding space, thereby to form said concave lenses being substantialy free of weld lines.

4,560,343

FUNCTIONAL CHECK FOR A HOT SURFACE IGNITOR ELEMENT

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 11, 1984, Ser. No. 619,527
Int. Cl.[4] F23N *5/00*
U.S. Cl. 431—66 **11 Claims**



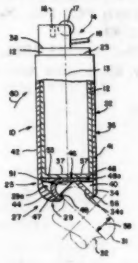
1. A system for functionally checking for continuity and operating temperature of a hot surface ignitor element prior to introduction of a fuel in a burner, including: a resistive hot surface ignitor element having two ends; said ends adapted to be connected by connection means to a source of power to draw a current in said system that in turn heats said element to a temperature capable of ignition of said fuel; electrode means which is separate from said burner and placed adjacent said hot surface ignitor element; said ignitor element and said electrode means placed adjacent said burner to ignite fuel from said burner when said fuel is introduced to said burner; and current responsive means for functionally checking said hot surface ignitor element prior to introduction of a fuel into said burner connected by said connection means to said source of power, one end of said hot surface ignitor element, and said electrode means; said current responsive means responding to a current flow between said hot surface ignitor element and said electrode means upon said hot surface ignitor element having reached a sufficient temperature to ignite said fuel to functionally check said ignitor element prior to introduction of said fuel.

4,560,344

COMBINATION CIGARETTE LIGHTER AND BOTTLE OPENER

Josef Kietaibl, Langley, Canada, assignor to Four Time Enterprises Ltd., Abbotsford, Canada

Filed Dec. 12, 1983, Ser. No. 560,141
Int. Cl.[4] F23Q *2/16*
U.S. Cl. 431—253 **4 Claims**



1. A combination cigarette lighter and bottle opener apparatus, comprising:

(a) an elongated hollow sleeve open at one end for receiving a disposable lighter assembly and bottle opening means at the other end thereof,

(b) a disposable lighter assembly including an igniter portion comprising ignition means and a fuel tank portion connected to said igniter portion,

(c) said fuel tank portion including a top wall, side walls and a bottom wall, said bottom wall having lever insert position retaining means,

(d) said fuel tank portion being positioned within said hollow sleeve with said igniter portion extending through said open end,

(e) said bottle opening means including a recess for receiving a bottle cap, said recess being formed between a lever portion for applying prying pressure to the rim of the bottle cap and a fulcrum portion for engaging the top of the bottle cap, said fulcrum portion and said lever portion being angularly disposed relative to each other and forming a V-shaped configuration in said other end of said hollow sleeve,

(f) an opening formed in said lever portion,

(g) said bottle opening means further including a separate, generally V-shaped metal lever insert having a first end portion including an outermost end, said first end portion being retained by said lever insert position retaining means, and said metal lever insert having a second end portion including an outer end extending into, through and projecting slightly beyond said opening formed in said lever portion to form a rim engaging edge for the bottle cap,

(h) said other end of said hollow sleeve having on the inside thereof, adjacent said lever portion, slot means for receiving said metal lever insert second end portion, and

(i) the apex of said V-shaped configuration of said other end of said hollow sleeve being spaced inwardly from said outermost end of said first end portion of said metal lever

insert, lying over said first end portion, and forming a locking means for said metal lever insert, whereby said apex of said V-shaped configuration and said slot means for receiving said metal lever insert second end portion prevent dislodgement of said metal lever insert from said hollow sleeve.

4,560,345

LIQUID GAS-OPERATED LIGHTER

Friedrich Schächter, Draschestrasse 31, A-1232 Vienna, Austria

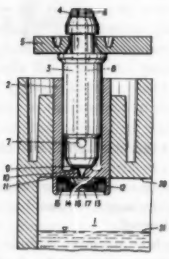
PCT No. PCT/AT81/00028, § 371 Date Jul. 23, 1982, § 102(e) Date Jul. 23, 1982, PCT Pub. No. WO82/01932, PCT Pub. Date Jun. 10, 1982

PCT Filed Nov. 23, 1981, Ser. No. 403,499

Claims priority, application Austria, Nov. 24, 1980, 5726/80

Int. Cl.⁴ F23D *13/04*

U.S. Cl. 431—344 **21 Claims**



1. Liquid gas-operated lighter, such as pocket lighter, comprising a burner tip, a fuel tank and, arranged therebetween, a valve assembly serving as the only means of communication between said fuel tank and said burner tip, an annular flange formed at an end face of said valve assembly facing said fuel tank, said flange defining a recess, said valve assembly including a valve bore opening to said recess communicating with said valve, a control device for the flame height which device is non-alterable by the user of the lighter, said control device received in said recess and including a fuel-permeable proportioning disk, said proportioning disk tightly braced in its border region toward said end face by means of a bracing member so that gas is enabled to flow only through said proportioning disk, the border region formed between said end face and said bracing member is rendered permanently gas-tight, said bracing member secured in its position by securing means formed on said flange and provided with passage means for the fuel, said proportioning disk on the side facing said burner tip facing a gas-permeable layer, characterized in that said proportioning disk is a microporous film having slot-shaped pores oriented in the direction perpendicular to the surface of said disk, and that said bracing member (15) together with said flange forms the conclusion of the lower end of said control device (12 to 16) and, in the vertical position of use of said lighter, said lower end is always spaced at a distance above the liquid phase of the liquid gas, and that the space between said lower end and the liquid level (21) is free from structural components, so that said lower end of said control device is exposed exclusively to the gaseous phase of the fuel in the vertical position of use of the lighter.

4,560,346

METHOD FOR HARDENING FORM SUBSTANCES OF BUILDING MATERIALS CONTAINING BINDING AGENTS AND AUTOCLAVE FOR THE EXECUTION OF THE METHOD

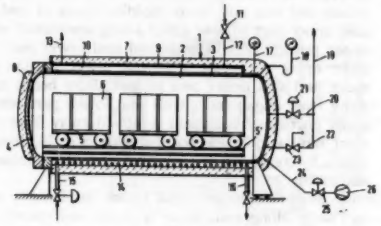
Eckhard Schulz, Wallenhorst, Fed. Rep. of Germany, assignor to Sicowa Verfahrenstechnik fuer Baustoffe GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 632,766

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326492

Int. Cl.⁴ F27D *7/00, 13/00;* **F26B** *5/04, 21/06*

U.S. Cl. 432—24 **30 Claims**



1. A method for hardening form substance of building material containing binding agents inside a pressure chamber of an autoclave, comprising conveying a gaseous heating medium to said autoclave, increasing the temperature of the building materials in said autoclave to a given upper limit during a heating-up phase, increasing the pressure within said autoclave above atmospheric pressure and at a pressure which precludes evaporation of water during said heating phase such as to prevent exposure of the form substances in the autoclave to evaporated wet vapor during the heating-up phase, maintaining the temperature in the autoclave at least until a given equalization temperature is reached on the inside of the form substances during a holding phase, maintaining the pressure within said autoclave above atmospheric pressure and at a pressure which precludes evaporation of the water during said holding phase such as to prevent exposure of the form substance in the autoclave to evaporated vapor during the holding phase, said steps of increasing the temperature and the pressure and maintaining the temperature and the pressure resulting in producing in said autoclave a temperature/pressure condition which precludes evaporation of water within the autoclave during said heating-up phase and said holding phase, subsequently reducing the temperature during a cooling-down phase to an expulsion temperature, and reducing the pressure in said autoclave during said cooling-down phase to atmospheric pressure, whereby the form substances are precluded from being exposed to evaported water vapor during the hardening thereof in the autoclave.

4,560,347

YARN HEATING CHAMBER

Walter Rünkel, Hückeswagen; Erich Lenk, and Karl Bauer, both of Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,301

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 3247040; Dec. 23, 1982, 3247626; Feb. 11, 1983, 3304752; Mar. 9, 1983, 3308251; Apr. 9, 1983, 3312823; May 21, 1983, 3318645; Jun. 11, 1983, 3321202; Jul. 22, 1983, 3326432; Oct. 5, 1983, 3336101

Int. Cl.⁴ F27B *9/28;* **F26B** *13/00*

U.S. Cl. 432—59 **34 Claims**

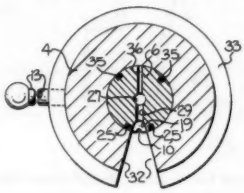
1. A heating chamber for thermally processing an advancing yarn and which is characterized by stable temperature condi-

tions which are substantially uneffected by a threading operation, and comprising

a first member which includes a surface having an elongate discontinuity therein,

a second member which includes a surface having an elongate discontinuity therein, and with the surface of the first member being substantially congruent with the surface of the second member,

means mounting said first and second members for relative movement between an operative position wherein the discontinuities are positioned relative to each other to define a relatively narrow passage which is formed between opposing portions of the first and second members for completely and closely surrounding the yarn along substantially the entire length of said heating chamber,



and a threading position wherein said discontinuities are positioned relative to each other to define an enlarged opening to facilitate threading of the yarn, and such that said surfaces of said first and second members are in substantial heat exchange relation in both said operative position and said threading position, and

means for heating at least one of said first and second members,

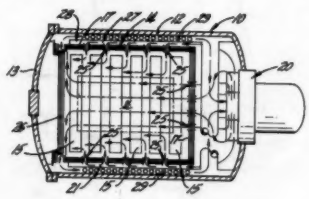
whereby said heating means acts to elevate the temperature of both of said first and second members to essentially the same temperature and so that a yarn passing through the yarn passage is thermally processed, and the temperature of the two members remains substantially the same during a yarn threading operation to provide for the uniform processing conditions for that portion of a yarn which is processed immediately after a yarn threading operation.

4,560,348

GAS NOZZLE FOR A HEAT TREATING FURNACE

Craig A. Moller, Loves Park, and Eric H. Wolter, Cherry Valley, both of Ill., assignors to Abar Ipsen Industries, Feasterville, Pa.

Filed May 24, 1984, Ser. No. 613,275
Int. Cl.[4] F27D *15/02*; F26B *21/12*; B05B *1/00*
U.S. Cl. 432—77 **7 Claims**



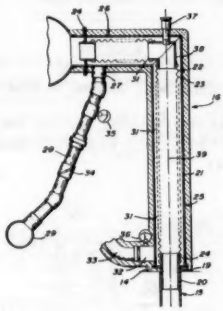
5. A gas nozzle for a heat treating furnace and comprising a single sheet of resiliently yieldable metal rolled into a tube with opposite end portions of the sheet overlapping one another to form an overlapping seam extending longitudinally of the tube, the overlapping end portions of said seam being free to move circumferentially of one another whereby the tube may be contracted inwardly by a radial squeezing force applied to the tube and, upon removal of the force, will expand outwardly by virtue of the resiliency of said material, and an outwardly extending flare formed around one end portion of said tube.

4,560,349

HEAT RECUPERATOR AND METHOD FOR USE WITH GAS-FIRED FURNACE USING NOZZLE OR PRE-MIX BURNERS

Leslie Vider, Hampstead, Canada, assignor to Sivaco Quebec, Quebec, Canada

Filed Sep. 14, 1984, Ser. No. 650,494
Int. Cl.[4] F28F *1/10*
U.S. Cl. 432—223 **1 Claim**



1. In a furnace having a hot chamber, a plurality of nozzle or pre-mix combustion burners in said hot chamber, radiant tubes connected to said combustion burners and extending into said hot chamber, an ambient air intake manifold and an exhaust manifold, heat recuperators for receiving exhaust gases from said hot chamber, each said recuperator comprising:

an uncorrugated cylindrical metal outer tube having the shape of an inverted L, a longer leg of said L extending vertically and terminating at a first end of said outer tube, said first end being secured to an extension of one of said radiant tubes, a shorter leg of said L extending horizontally and terminating at a second end of said tube, said second end being secured to said exhaust manifold;

an inverted L shaped uncorrugated metal corner tube in said outer tube at a joint between said longer and shorter legs, said corner tube having one end extending into said longer leg and another end extending into said shorter leg;

first and second imperforate inner metal tube members, said inner tube members each being formed as a corrugated tube having smoothly undulating corrugations defining both inner and outer walls thereof, said corrugations providing a direct heat transfer surface area at least twice that of a straight tube, said first inner tube member being connected between said radiant tube extension and said one end of said corner tube, said second inner tube member being connected between said exhaust manifold and said another end of said corner tube, said inner tube members and said corner tube together forming an inverted L shaped inner tube within said outer tube to discharge exhaust gas to said exhaust manifold, said inner tube being spaced from said outer tube to define an annular space between said inner and outer tubes, said annular space extending from said first end to said second end of said outer tube;

an outlet conduit connected between one of said combustion burners and a portion of said annular space adjacent said first end of said outer tube, said combustion burners being positioned adjacent said first end of said outer tube to minimize the length of said outlet conduit;

a connecting conduit connected between said intake manifold and a portion of said annular space adjacent said second end of said outer tube;

an air blower in said intake manifold for blowing ambient air through each said connecting conduit, said annular space and said outlet conduit to said combustion burners, whereby said corrugations induce turbulence in said ambient air and provide a large heated surface area to enhance heat exchange between said heated exhaust gas and ambient air;

insulation covering said outer tube and said outlet conduit;

a sighting tube aligned with said longer leg of said L shape of said outer tube, said sighting tube extending through said outer tube and said corner tube; and

a control valve in said connecting conduit to control a quantity of air fed into said annular space.

4,560,350

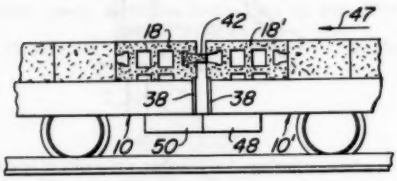
END BLOCK

Troy Doby, Guilford, N.C., assignor to Resco Products, Inc., Norristown, Pa.

Filed Mar. 29, 1984, Ser. No. 594,512

Int. Cl.⁴ F27D *3/12*; E04C *3/10*; E04B *5/04*

U.S. Cl. 432—241 **24 Claims**



1. Apparatus comprising two kiln cars with adjacent ends, a row of end blocks aligned adjacent to said end of each of said cars, and a resilient refractory member retained in a transverse recess in at least one of said blocks on one of said cars and bridging between said kiln cars contacting at least one of said blocks on the other of said kiln cars.

4,560,351

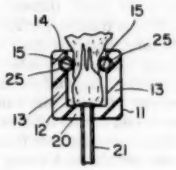
METHOD OF AND APPARATUS FOR APPLYING DENTAL TREATMENT FLUID

Travis H. Osborne, 905 Lebanon St., Lebanon, Ind. 46052

Filed Jul. 5, 1984, Ser. No. 628,141

Int. Cl.⁴ A61C *17/02*

U.S. Cl. 433—80 **11 Claims**



1. A dental apparatus for applying fluid to the teeth and gums comprising:

a tray for one of the jaws configured to surround the teeth and gums and having an open topped channel into which the teeth and gums can extend;

inflatable seal means secured to said tray for conforming to the gums and providing an air-tight seal between the gums and the perimeter of the channel; and

conduit means for communicating with the channel of said tray.

4,560,352

DISPENSER FOR METERING DENTAL COMPOSITIONS

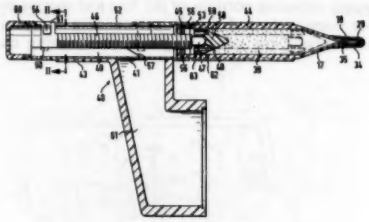
Alexander Neümeister, Munich, and Wolf-Dietrich Herold, Hechendorf, both of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Präparate GmbH, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,830

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240785

Int. Cl.⁴ A61C *5/04*

U.S. Cl. 433—90 **16 Claims**



1. A dispenser for metering dental compositions, comprising

(a) a casing with a dispensing opening,

(b) a plunger movable within said casing, the space defined between the plunger and said dispensing opening serving to accommodate the dental composition,

(c) a threaded spindle which acts on said plunger and is axially movable relative to said casing,

(d) a nut fixed to said casing and being rotatable relative to said spindle for advancing the same,

(e) a sleeve member surrounding said spindle and including means for supporting said spindle non-rotatably but axially movably and means for retaining said casing rotatably but axially not movably, and

(f) a handle detachably joined to said sleeve member.

4,560,353

TOOTH IMPLANT

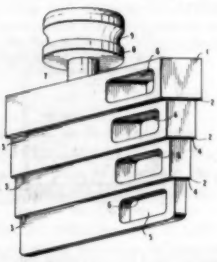
Willi Schulte, Tübingen, and Günther Heimke, Weinheim, both of Fed. Rep. of Germany, assignors to Friedrichsfeld GmbH - Steinzeug- und Kunststoffwerke, Mannheim, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,787

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226831

Int. Cl.⁴ A61C *8/00*

U.S. Cl. 433—173 **14 Claims**



1. Implant made of a metal which is corrosion resistant in the body, consisting of an essentially leaf-shaped part to be inserted into the jaw bone, a post part for leading from the jaw bone right through the mucous membrane into the mouth cavity and means, provided at the end of the post part adapted to point

into the mouth cavity, for attachment of a superstructure, characterized in that the leaf-shaped part has steps, the step surfaces of which are disopsed away from the post part and accordingly point into the jaw bone in use, that the post part is cylindrical in the area for extending through the mucous membrane and in such area carries a ring of bioinert ceramic, which has an annular groove on its outer surface, and that the means for attaching said superstructure consists of a blind hole disposed in the post part.

4,560,354

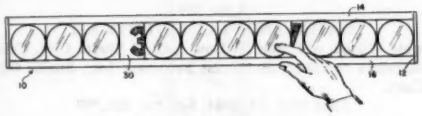
DEVICE FOR TEACHING DECIMAL MATH

Seeber T. Fowler, Rte. 3, Box 1176, Ft. McCoy, Fla. 32637

Continuation-in-part of Ser. No. 440,707, Apr. 4, 1983, abandoned. This application Oct. 11, 1984, Ser. No. 659,968

Int. Cl.[4] G09B *19/02*

U.S. Cl. 434—208 **21 Claims**



1. A math teaching device particularly designed for teaching place value to students, comprising an elongate frame utilizing guide means disposed along each of its long edges, a plurality of closely similar counting pieces slidably mounted on an upper portion of said frame, which counting pieces are independently movable, and retained in an operative relationship to each other and to said frame by said guide means, said frame having a recessed portion configured to receive an elongate display member, with a display member residing in said frame at a location below said counting pieces, said elongate display member being in effect divided along its long dimension into eleven spaces of approximately equal size and having indicia thereon, with such indicia being placed at a spacing that is consonant with the size and number of counting pieces utilized, said indicia including ten numerals placed in ascending order from left to right and involving no duplicate numerals, with the eleventh space at the far right remaining blank.

4,560,355

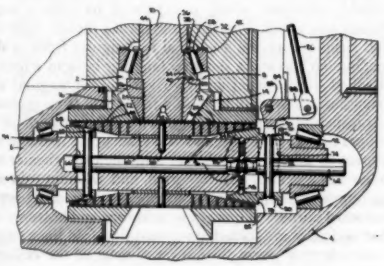
MARINE DRIVE THREAD MOUNTED PINION

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1983, Ser. No. 566,492

Int. Cl.[4] B63H *23/08*

U.S. Cl. 440—86 **8 Claims**



1. Threaded pinion drive gear apparatus for a marine drive lower gear case, comprising:

a propeller shaft rotatably mounted in said lower gear case;

drive gear means in said lower gear case for driving said propeller shaft, and including:

a drive shaft extending downwardly into said lower gear case and rotatable about an axis substantially orthogonal to said propeller shaft;

a pinion gear internally threaded, thread mounted at the bottom end of said drive shaft, said drive shaft being externally threaded;

rotatable driven gear means concentric with said propeller shaft and driven by said pinion gear to drive said propeller shaft; and

overrunning clutch means connected to said propeller shaft and movable to engage said driven gear means to apply loading force to bias said pinion gear to a thread tightened condition and prevent unscrewing of said pinion gear from said drive shaft.

4,560,356

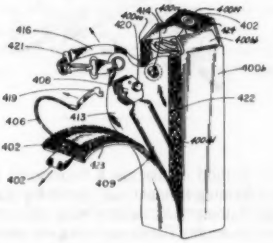
PERSONAL FLOTATION DEVICE

J. Kelsey Burr, Jupiter, Fla., assignor to Halkey-Roberts Corporation, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 462,213, Jan. 31, 1983, Pat. No. 4,498,879. This application Jul. 18, 1983, Ser. No. 514,442

Int. Cl.[4] B63C *9/22*

U.S. Cl. 441—80 **4 Claims**



1. An emergency rescue assembly for rescuing a person in a body of water, comprising in combination:

a container including left and right side walls, top and bottom walls, and front and rear walls, said side, bottom and rear walls being secured together to form an open-ended enclosure, said front wall being secured along one edge to said bottom wall to form a front flap, said top wall being secured along one edge to said rear wall to form a top flap;

means for removably fastening said front wall to said side walls and to said top wall whereby said front wall may be secured in a closed position fastened to said side walls and to said top wall to close the open-ended enclosure and whereby said front wall may be pulled open to an opened position allowing access to said container;

an inflatable personal flotation device stored within said container;

means for inflating said personal flotation device upon pulling said front wall to said opened position, said inflating means including

storage means containing a supply of compressed gas,

valve release means associated with said storage means and including a puncture pin operatively disposed within a body for piercing said storage means allowing the gas contained therein to flow into said personal flotation device,

said valve release means further including a removable cam-shaped lever having a cut-out mounted on a pivot pin and a lanyard having one end connected to said cam-shaped lever for pivoting said cam-shaped lever about said pivot pin to drive said puncture pin into said storage means whereupon said cam-shaped lever is disengaged from said body,

means for connecting another end of said lanyard relative to said front wall functioning as said front flap, whereby said valve is automatically actuated to begin inflation of

said personal flotation device upon pulling of said front flap; and

tether means securely interconnecting said container and said personal flotation device.

4,560,357

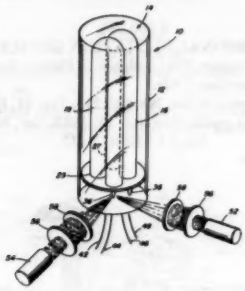
METHOD FOR SEALING ARC DISCHARGE LAMPS

Andre C. Bouchard, Peabody, and Mark W. Grossman, Belmont, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 18, 1984, Ser. No. 621,341

Int. Cl.[4] H01J *9/24, 9/395*

U.S. Cl. 445—26 **4 Claims**



1. In the method of making a fluorescent lamp the steps comprising: forming an inner lamp assembly including at least one section of phosphor coated tubing, said tubing having its ends closed by sealing flares mounting electrodes within said tubing, said sealing flares comprising a first glass portion having an inner exhaust tubulation projecting therefrom; mounting said inner lamp assembly within an envelope formed from glass transparent to a given range of radiation; sealing an open end of said envelope while leaving a second exhaust tubulation, exhausting said envelope and inner lamp assembly through said second exhaust tubulation; filling said envelope with an arc generating and sustaining atmosphere including mercury, through said second exhaust tubulation; sealing said second exhaust tubulation to hermetically seal said envelope; and directing focused, coherent radiation through said envelope upon said inner exhaust tubulation, said radiation being in an amount sufficient to raise the temperature of said inner exhaust tubulation to its softening point.

4,560,358

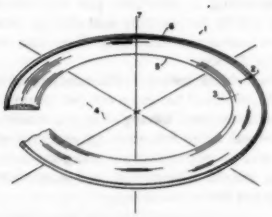
GLIDING RING

Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94306

Filed May 10, 1984, Ser. No. 608,791

Int. Cl.[4] A63H *27/00*

U.S. Cl. 446—46 **15 Claims**



1. A gliding ring comprising;

a closed-figure airfoil having a planform comprising;

an upper and lower surface,

a central opening,

an inner perimeter encompassing said central opening,

an outer perimeter encompassing said inner perimeter,

an axis of revolution which is substantially normal to the planes described by said inner and outer perimeters,

said airfoil having a cross-section comprising;

a line defining said lower surface,

a convex line defining said upper surface, said convex line reaching a zenith which is the highest point on the airfoil section of said ring,

a separator lip on said upper surface and located on or near said outer perimeter,

said separator lip extending to a narrow peak which is higher than the immediately adjacent portion of said upper surface.

4,560,359

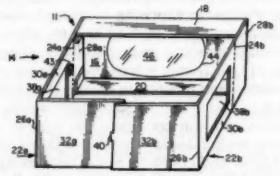
WATCH AND PLAY ACTIVITY KIT

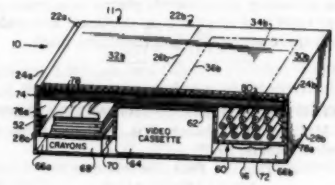
Angele Wilson, and John Wilson, both of Studio City, Calif., assignors to Direct Broadcast Programs Inc., Studio City, Calif.

Filed Mar. 21, 1984, Ser. No. 591,797

Int. Cl.[4] A63H *33/04;* **A63J** *19/00*

U.S. Cl. 446—75 **10 Claims**





1. A self-contained watch and play activity kit comprising:

a foldable structure which is expanded to form a puppet theater and which is collapsed to form a theater container, said structure having a vertical rectangular front, a short rectangular top and a short rectangular bottom which are attached to said front and two vertical rectangular sides extending rearwardly from said front; said front including a transparent portion through which the interior of the puppet theater is visible; and said sides being foldable with respect to said front such that said enclosed theater container has a central space therein, and wherein said sides include a weakened first fold line passing adjacent the rearward corners of respective said tops and bottoms such that said sides are folded along said first fold lines parallel to said front to form the back and sides of the collapsed theater container, and wherein said sides further include a weakened second fold line parallel to said first fold line and located at an intermediate position between said first fold line adjacent the rearward corners of said tops and bottoms and the back edge of said respective side such that by folding said sides inwardly along said second fold lines a back for said puppet theater is produced; and

a removable insert which is sized to be snugly received in the

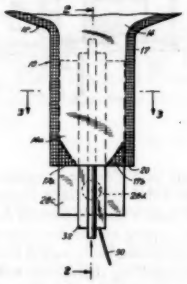
central space of said folded theater container and thereby held relatively immovably therein, said insert including a video cassette holding means for holding a video cassette relative to said insert, said insert further forming a closed compartment with said folded theater container in which various props for the puppet theater are stored.

4,560,360

INFLATABLE ASSEMBLY WITH EDGE CLOSURE

Michael S. Isaacs, 175 Falmouth St., and Richard Blacksberg, 182 Amherst St., both of Brooklyn, N.Y. 11235

Filed Jun. 20, 1983, Ser. No. 505,995
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—222 **11 Claims**



1. An inflatable assembly comprising:

a. A device formed of sheet material defining a generally closed gas-receiving compartment including opposing sheet portion having generally aligned initially unsealed edges which define an opening to said compartment;

b. an external and reusable conduit adapted to be associated with a source of gas, said conduit being inserted into said opening prior to inflation;

c. adhesive means provided on a surface of at least one of said sheet portions facing the other of said sheet portions; and

d. separator means disposed between said adhesive means and said other of said sheet portions and defining, with said other sheet portion, a passage for said external and reusable conduit, said separator means being provided with a slip surface on at least one surface thereof facing said adhesive means which does not adhere to said adhesive means and can slideably move relative to said adhesive means when in abutment therewith to prevent premature attachment of said sheet portions to each other and being adapted to be removed thereby exposing said adhesive means to said other of said sheet portions, whereby removal of said separator means and said external and reusable conduit subsequent to inflation of said inflatable device and application of pressure to said sheet portions seals said opening to prevent escape of gas therethrough.

4,560,361

WHEELED TOY WITH WHEEL-DRIVEN DECORATIVE MEANS

Paul Cantu, 4012 Tod Ave., E. Chicago, Ind. 46312

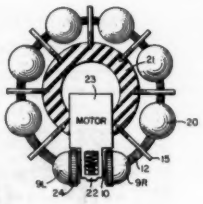
Filed Apr. 23, 1984, Ser. No. 603,249
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—231 **3 Claims**

1. A wheeled vehicular toy with a generally cylindrically shaped vehicle body and a plurality of rotatable wheels propellable across a surface contacted by at least one of said rotatable wheels to drive the vehicle, comprising in combination,

a shaft coupled to and rotatable with two of said rotatable vehicles, drive wheels contacting the surface,

a flexible cable having it's ends coupled to two opposite ends of the shaft for rotation therewith,

rotatable means comprising a set of spaced decorative spheres coupled with said cable at different positions therealong to rotate therewith thereby to ring said cylindrical body with said set of spheres that rotate as the vehicle moves, and



guide means coupled to the body of the vehicle for journalling the cable for rotation, said guide means being located between adjacent ones of said spheres and between said spheres and said wheels,

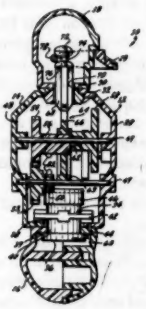
whereby rotation of the wheel as the vehicle moves causes the spheres to rotate by means of the interposed cable.

4,560,362

ANIMATED FIGURE TOY HAVING A MOVEABLE TORSO AND ARTICULATING JAW

Larry H. Renger, Hawiian Gardens, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 3, 1985, Ser. No. 688,666
Int. Cl.[4] A63H *3/20*
U.S. Cl. 446—340 **7 Claims**



1. In combination with a figure toy having an upper torso, a lower torso and a head, and means rotatably connecting said lower torso to said upper torso, and further means rotatably mounting said head on said upper torso, the improvement which comprises:

a jaw member articulately mounted on said head;

a gear train and elongated rod means connected together and moveably mounted within said upper torso, and coupled to said jaw member; and

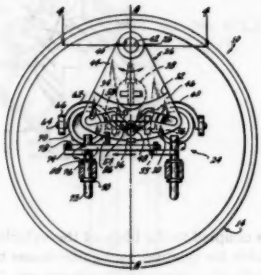
means coupling said upper and lower torsos together and coacting with said gear train whereby, upon rotation of said torsos with respect to each other, said gear train will be actuated to reciprocate said elongated member to thereby articulate said jaw.

4,560,363

EYE-MOVING MECHANISM FOR A FIGURE TOY

Richard G. Garza, Paramount; Pinhas Sayegh, and James R. Bjorklund, both of Los Angeles, all of Calif., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 3, 1984, Ser. No. 567,465
Int. Cl.[4] A63H *3/38*
U.S. Cl. 446—342 **1 Claim**



1. In combination with a figure toy including a head having eye openings provided therein, the improvement which comprises:

means mounting an eyeball in each of said openings for side-to-side movement with respect thereto;

means mounting an eyelid in each of said openings for at least partially covering and uncovering a respective one of said eyeballs;

means linking said eyelids together for concurrent eyeball covering and uncovering movements;

means linking said eyeballs together for concurrent side-to-side movements;

a pendulum, said pendulum being substantially pie-shaped and including an apex, a base and an intermediate portion, said intermediate portion lying between said apex and said base, said pendulum also including an area extending from said base to said intermediate portion which is offset from the portion of said pendulum which extends from said intermediate portion to said apex;

means rotatably connecting said apex to said head above and between said eye openings in a manner such that said offset area extends to a position directly behind said eyelid-linking means;

an M-shaped cam provided on said pendulum in said offset area;

an elongated cam follower having first and second ends, one of said first and second ends of said cam follower being affixed to said eyelid-linking means and the other of said first and second ends of said cam follower extending into operative engagement with said M-shaped cam, whereby oscillation of said pendulum moves said M-shaped cam in a manner such that said elongated cam follower is moved up and down causing said eyelids to blink;

a protuberance affixed to said base on said pendulum in alignment with said apex;

a post affixed to said eyeball-linking means adjacent each of said eyeballs, each of said posts lying in the path of travel of said protuberance, whereby oscillation of said pendulum will bring said protuberance into engagement with said posts for effectuating said side-to-side movement of said eyeballs; and

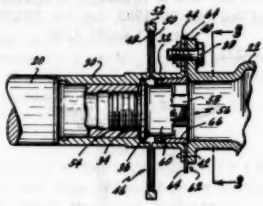
a weight affixed to the intermediate portion of said pendulum in alignment with said apex and said protuberance for adding inertia to said pendulum.

4,560,364

FAIL-SAFE IMPROVEMENT FOR A FLEXIBLE SHAFT COUPLING

Edwin E. Cohen, Venice, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Continuation of Ser. No. 319,187, Nov. 9, 1981, Pat. No. 4,457,734. This application Dec. 2, 1983, Ser. No. 557,315
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.[4] F16D *3/10, 3/79*
U.S. Cl. 464—30 **4 Claims**



1. An improvement in a flexible coupling having a first member coupled with a first shaft and a second member coupled to a second shaft with a flexible portion coupling said first and second members, a plug means for coupling to said first shaft and extending therefrom, and a socket means for coupling to said first shaft and extending therefrom, and a socket means for coupling to said second shaft and mating with plug means so that said first and second shafts continue to be driven when said flexible portion coupling said first and second shaft fails, said improvement comprising:

a thickened eccentric portion of said plug means capable of withstanding substantial impact against said socket means; and

a substantial enlargement in an opening defined by said socket means for receiving the eccentric portion of said plug means, approximating the shape of said plug means extending within said socket means, said enlargement being characterized by sufficient clearance between said plug means and socket means such that when said plug means is not engaging said socket means and when said flexible portion has failed, thereby decoupling said first and second shafts, said first and second shafts are permitted by said clearance between said plug means and socket means to assume a substantially inclined angle with respect to each other,

whereby failure of said flexible coupling becomes immediately visually observable by virtue of said substantial inclination of said first and second shafts with respect to each other.

4,560,365

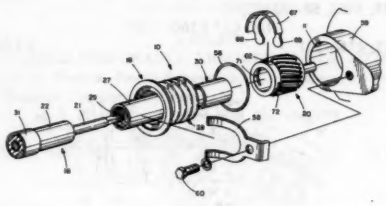
VEHICLE SPEED SENSOR

Frank C. Weaver, Chicago, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Oct. 6, 1983, Ser. No. 539,489
Int. Cl.[4] F16H *37/02*
U.S. Cl. 464—52 **8 Claims**

1. In an assembly for transmitting rotary motion from the gearing of a vehicle transmission to an indicating device with a housing access bore being provided in the transmission for receiving the assembly, the combination comprising; a one-piece rigid plastic ferrule mounted in the access bore and having an axially extending opening therethrough, a cable assembly connected to the ferrule including a drive shaft extending through the opening in the ferrule, and gear means drivingly connected to the drive shaft adapted to be driven by a gear in the transmission, said ferrule having at least three spaced integral annular rings transverse with respect to the

drive shaft extending outwardly therefrom engaging the housing access bore to support the ferrule in the housing and align the drive shaft, said integral rings being rigid with substantially equal axial thickness and having a diameter slightly less than



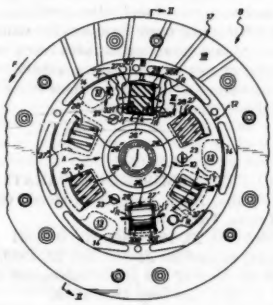
the diameter of the access bore to minimize ferrule distortion and eliminate drive shaft misalignment, said rings being sufficiently rigid and sized with respect to the housing bore so that they do not deform significantly at normal elevated transmission temperatures.

4,560,366

TORSIONAL DAMPER

Pierre Loizeau, Ville D'Avray, France, assignor to Valeo, Paris, France

Filed Feb. 7, 1984, Ser. No. 577,720
Claims priority, application France, Feb. 21, 1983, 83 02768
Int. Cl.[4] F16D *3/14, 3/66*
U.S. Cl. 464—68 **5 Claims**



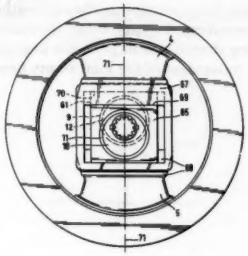
1. A torsional damper comprising at least two coaxial parts mounted so as to be rotatable relative to one another within predetermined limits of relative angular movement, multiple stage circumferentially acting elastic means disposed between said coaxial parts in the circumferential direction and including at least one block of elastic material extending in a substantially tangential direction relative to a circumference of the damper and partially housed, without circumferential clearance in a rest configuration of the damper, in an opening formed for this purpose in a first of said coaxial parts, and partially housed, with circumferential clearance in said rest configuration and for at least a first circumferential direction, in an opening formed for this purpose in a second of said coaxial parts, wherein at least one said elastic material block has at least one elastic material peg projecting from it in said first circumferential direction from its corresponding circumferential end which is partly covered by a distribution and retaining plate formed with a notch in its peripheral margin which is open in the radial direction and through which said elastic material peg passes, said peg defining a low damping stage adapted to intervene for smaller relative angular displacements of the coaxial parts than the rest of the associated elastic material.

4,560,367

TORSIONALLY ELASTIC COUPLING

Franz-Josef Wolf, and Hubert Pletsch, both of Bad Soden-Salmünster, Fed. Rep. of Germany, assignors to WOCO Franz-Josef Wolf & Co., Bad Soden-Salmünster, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,742
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243644
Int. Cl.[4] F16D *3/68*
U.S. Cl. 464—83 **18 Claims**



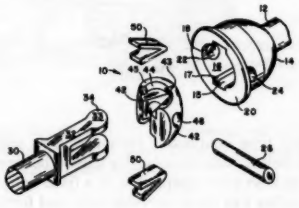
1. A rotationally elastic coupling comprising two rotatable half coupling means, an eccentric disc mounted on one of said half coupling means, said eccentric disc being displaced along a translatory path of travel upon rotation of said one half coupling means, resilient means mounted on said other half coupling means, an intermediate means operably connected to said eccentric disc via a bearing disposed about said eccentric disc and to said resilient means for transforming the translatory path of movement of said eccentric disc to a substantially generally radially directed movement such that said intermediate means thereby imparts a generally radially directed force to said resilient means in resiliently resisting relative rotation between said two half coupling means, whereby said two rotatably half coupling means are thereby resiliently coupled.

4,560,368

SINGLE PIN UNIVERSAL JOINT

William E. Sherman, II, Granger, Ind., and Edgar A. Behrmann, Niles, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 31, 1984, Ser. No. 645,981
Int. Cl.[4] F16D *3/26, 3/24*
U.S. Cl. 464—112 **15 Claims**



1. A universal joint comprising first and second rotatable members capable of being rotated with their axes angularly disposed with respect to one another, the first rotatable member including a head having an opening communicating with an interior cavity, the second rotatable member having a pair of spaced arms located at an end and each spaced arm including an ear, a cage member made of plastic material and disposed within the interior cavity, the cage member having a

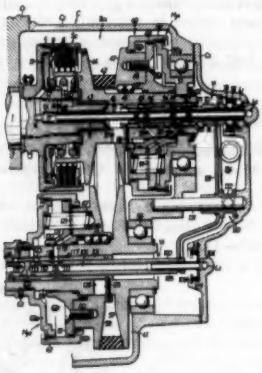
pair of complementary shaped openings capturing said ears such that said second rotatable member can rotate about said ears in a plane relative to said cage member, retaining means extending between diametrically opposed portions of said cavity and extending into said cage member and between the ears of said second rotatable member to permit rotation of said cage member, and resilient means disposed between said arms and adjacent surface of the cavity to provide resilient loading for the joint, the cage member comprising a plastic member including two sections connected by a living hinge, the cage member disposed about said ears by pivoting said sections about the living hinge to capture the ears within the openings of the cage member, the ears being maintained within said complementary shaped openings of the cage member to provide lash free movement of the joint in any direction of movement.

4,560,369

BELT TYPE CONTINUOUS REDUCTION GEAR MECHANISM

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,715
Claims priority, application Japan, Dec. 10, 1981, 56-198796
Int. Cl.⁴ F16H *11/04*
U.S. Cl. 474—28 **7 Claims**



1. A belt type continuous reduction gear mechanism, in which a V-belt is made to run under tension between drive and driven V-pulleys each equipped with a fixed pulley half and a movable pulley half made movable back and forth relative to said fixed half for adjusting an effective radius, wherein the improvement comprises:

fluid actuators disposed in said drive and driven V-pulleys, respectively, for moving said movable pulley halves of the same back and forth;

a control valve associated with each fluid actuator, for controlling respective amounts of movements of the movable pulley halves; and

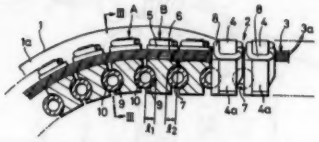
a coaction mechanism interposed between said control valves for effecting the coactions of the same.

4,560,370

V-BELT POWER TRANSMISSION

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,177
Claims priority, application Japan, Nov. 7, 1983, 58-207539; Dec. 15, 1983, 58-193335[U]
Int. Cl.⁴ F16G *5/20*
U.S. Cl. 474—201 **6 Claims**



1. A power transmission V-belt comprising:

an endless belt mounted between drive and driven pulleys;

a plurality of V-shaped metal members arranged on said endless belt serially in the longitudinal direction thereof, each of said V-shaped metal members being formed with a groove to provide a contacting surface in contact with an inner surface of said endless belt; and

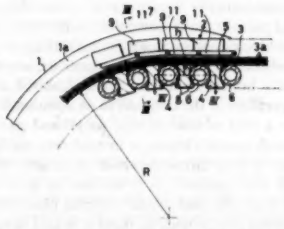
a plurality of intermediate members positioned at inner side of said endless belt and each being interposed between neighboring V-shaped metal members, each of said V-shaped metal members having both sides in running direction of said endless belt, and formed with receiving surfaces for receiving one of said roller members, said receiving surfaces being in arcuate form, and the radius of curvature of one of said receiving surfaces being substantially equal to that of said intermediate members, whereas the radius of curvature of the other surface being larger than that of said one receiving surface.

4,560,371

V-BELT TRANSMISSION APPARATUS

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 603,061
Claims priority, application Japan, Apr. 23, 1983, 58-70920
The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.
Int. Cl.⁴ F16G *5/16*
U.S. Cl. 474—201 **8 Claims**



1. A V-belt transmission comprising V-groove pulleys, an endless belt; a plurality of V-shaped belt engaging means positioned along said endless belt in the longitudinal direction thereof, each having a belt engaging surface for engaging said endless belt; a plurality of intermediate means positioned between adjacent engaging means, said intermediate means being positioned on the inside of said endless belt; wherein each of

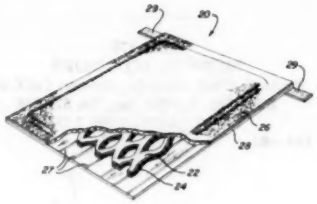
said engaging means includes receiving surface means for contacting said adjacent intermediate means, at least one of said receiving surfaces means being shaped to apply a force to said intermediate means in the longitudinal direction of said belt when said engaging means are brought into contact with the V-grooves of said V-groove pulleys.

4,560,372

STABLE DISPOSABLE ABSORBENT STRUCTURE

Heinz A. Pieniak, North Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed May 1, 1984, Ser. No. 606,075
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—369 11 Claims



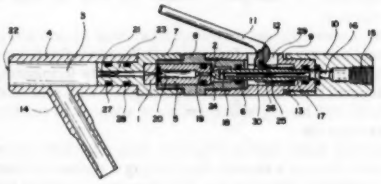
1. An absorbent product comprising a layered structure, which structure is comprised of a first fibrous layer substantially of resilient fibers and containing at least about 10% by weight superabsorbent and a second layer of hydrophilic porous material, said layers being substantially coextensive superposed one on the other and subjected to at least about 200 psi pressure in the presence of from about 10% to about 50% moisture to form said structure, said structure being provided with longitudinally parallel slits in staggered rows, said slits being at least about 0.5 inch in length, said rows being from about 0.1 to about 0.5 inches apart, said slit structure being extended transversely to provide an apertured structure, and said apertured layered structure being sandwiched between a liquid-impermeable barrier and a liquid-permeable facing.

4,560,373

SURGICAL NOZZLE APPARATUS

Kenji Sugino; Yoshihiro Sugino, both of Uozu; Mikio Tatsuguchi; Kensaku Eda, both of Toyama; Yoichi Kasai, Sapporo; Tsuyoshi Nishisaka, and Motoki Yonekawa, both of Tokyo, all of Japan, assignors to Sugino Machine Limited, Uozu, Japan

Filed Jun. 6, 1984, Ser. No. 617,793
Claims priority, application Japan, Jun. 6, 1983, 58-101233
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—30 9 Claims



1. A surgical nozzle apparatus for forcibly injecting a single jet stream of fluid from a pressurized fluid source into living tissue to excise undesired tissue and to remove injected fluid and excised tissue, said apparatus comprising:

a handpiece provided with a nozzle piece for forcibly ejecting a stream of said pressurized fluid, and a suction nozzle comprising a tubular conduit having an inlet opening at a position downstream of said nozzle piece along the axis of flow of fluid ejected from said nozzle piece and at the site of contact of said stream and tissue undergoing excision, and external suction means in communication with said suction nozzle effecting withdrawal of said fluid and excised tissue from the site of said excision.

4,560,374

METHOD FOR REPAIRING STENOTIC VESSELS

Julius G. Hammerslag, 27011 Calle Esperanza, San Juan Capistrano, Calif. 92675

Filed Oct. 17, 1983, Ser. No. 542,850
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—49 1 Claim

1. The method of inhibiting recurrence of stenosis in the coronary arterial system in the region of a treated stenosis, comprising moving a thin-walled elastic liner substantially conforming to the internal blood vessel wall into a location within the stenotic blood vessel region with said liner disposed on a balloon of a catheter, expanding the balloon to force the liner into engagement with the blood vessel wall, deflating the catheter and removing the catheter from the blood vessel, leaving the liner in place in said location.

4,560,375

FLOW CONTROL VALVE

Rudolf R. Schulte; Gary P. East, both of Santa Barbara; Marga M. Bryant, and Alfons Heindl, both of Goleta, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Santa Barbara, Calif.

Continuation-in-part of Ser. No. 510,381, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 208,514, Nov. 20, 1980, abandoned. This application Jan. 30, 1984, Ser. No. 575,165
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 43 Claims

33. A surgically implantable flow control valve for controlling the flow of fluid from one portion of the human body to another, said valve comprising:

an inlet;

an outlet;

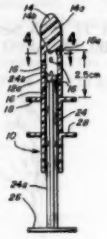
a base including a plate having an inlet surface in communication with said inlet and an outlet surface in communication with said outlet;

an aperture through said plate permitting said inlet to communicate with said outlet; and

a flow control member including a central support and a resilient membrane, said central support being securely attached to said outlet surface and extending therefrom to support said resilient membrane, said resilient membrane being generally arch-shaped so that the outer edges of said

membrane contact said outlet surface in a manner surrounding said aperture.

4,560,376
ANAL MEDICATION APPLICATOR
Joseph P. Cannon, 4440 W. 95th St., Oak Lawn, Ill. 60453
Filed Jan. 16, 1984, Ser. No. 571,367
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—54 **4 Claims**



1. An applicator for dispensing anal medication to the sensory portion of an anal canal, comprising:

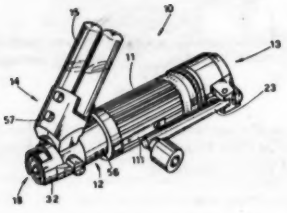
A. a syringe-type barrel having a cylindrical wall closed at one end thereof;

B. stop means fixed on said barrel for engagement with a user's anus to limit the length of penetration of said barrel into the user's anal canal;

C. a plurality of lateral apertures through said cylindrical wall, said apertures being located within approximately 2.5 centimeters measured along the wall from said stop means toward said closed end, for limiting discharge of medication to the sensory portion of said anal canal adjacent said stop means; and

D. expelling means for forcing discharge of said medication laterally from the barrel through said apertures.

4,560,377
ENDERMIC INJECTOR DEVICE
Mario Geat, Lucinicco, and Luciano Dornik, Gorizia, both of Italy, assignors to SICIM SpA, Romans d'Isonzo, Italy
Filed Jan. 20, 1984, Ser. No. 572,387
Claims priority, application Italy, Jan. 24, 1983, 83310 A/83
Int. Cl.[4] A61M *5/30*
U.S. Cl. 604—68 **14 Claims**



1. An endermic injector device for subcutaneous injections without a needle, said device being suitable for injecting under pressure at least one fluid drawn in a measured dose from replaceable phials, preferably of a throwaway type, said device comprising

nozzle means,

means to aspirate fluid,

means to expel fluid, and

means to provide the required force of expulsion, said device further comprising in cooperation

means for aspiration and injection comprising (1) a valve means to draw and deliver fluid, (2) a cylindrical chamber for containing fluid together with a removable small piston, and (3) safety means having an alignment head,

means to control aspiration and expulsion comprising (1) means for axial withdrawal of said small piston, (2) tripping means, and (3) spring means for the forward axial movement of said small piston,

means to display the quantity of said fluid, and

means to hold and position said phials comprising at least one containing lodgement with two needles cooperating with valve means for temporary connection with said cylindrical chamber and with the atmosphere respectively.

4,560,378
MEDICAL ACCESSORY
Mary C. Weiland, 13867 Aztec St., Sylmar, Calif. 91342
Filed Sep. 6, 1983, Ser. No. 529,368
Int. Cl.[4] A61M *3/00, 5/00*
U.S. Cl. 604—83 **1 Claim**

1. In a medical apparatus for use in performing medical procedures of an open system type employing an elongated, pliable patient in-place feeding or drainage tube, the combination comprising:

a syringe having a dispensing tip;

a pliable extension tube having one end detachably coupled with said syringe dispensing tip and its opposite end detachably coupled to said patient in-place tube;

fluid control means operably carried on said extension tube operable to selectively restrict the flow of fluid therethrough;

plug means disposed between said syringe tip and one end of said extension tube for mixing at least two fluids together;

said plug means comprising a hollow body terminating in a tapered portion adapted to be coupled with said extension tube and having a first entrance adapted to receive said syringe tip;

said plug body further provided with a laterally extending body having a tapered base having a second entrance for receiving a selected one of a plurality of syringe tips;

said plug means including closure means carried on said body and said lateral body for selectively sealing said bodies in the absence of syringe connections;

clip means operably carried on said syringe for releasably supporting said apparatus from supporting material or structure; and

said fluid control means includes a rotary valve threadably

carried on a strap-like body movably mounted on said extension tube for selectively closing said extension tube to restrict fluid flow therethrough.

4,560,379

ABSORBENT HYGIENIC ARTICLE AND METHOD OF MANUFACTURE

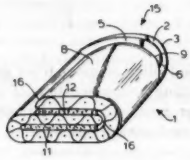
Kurt Stemmler, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschenfabrik und Eigengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 674,683

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3344032

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—368 **3 Claims**



1. An absorbent article for hygienic purposes, such as sanitary napkins, disposable diapers or the like, comprising a highly absorbent body-fitting one-piece uncut flock member integrally-formed and shaped by a flock wheel and thereby having completely soft edge zones, said flock member having an elongated central member having rounded front and rear ends, said central member merging by way of its long sides into a long side member and a short side member which are symmetrically disposed with respect to said central member and both are provided with rounded front and rear ends, said long side member being folded onto the surface of said central member and said short side member being folded onto the back side of said folded long side member to form a folded absorbent article of generally "3" shaped cross-section which is stepped frustum-fashion at its front end and at its rear end; and a layer of superabsorbent material disposed between at least one pair of the contiguous surfaces of the folded-together members of the article.

4,560,380

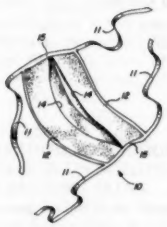
DISPOSABLE THERAPY DIAPER

Morene J. Tharel, Rio Rico, Ariz., assignor to Flare Products, Inc., Nogales, Ariz.

Filed Sep. 29, 1982, Ser. No. 427,703

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—385 R **1 Claim**



1. A disposable therapy diaper for infants, comprising:

a front portion, a rear portion and two side portions connecting said front and rear portions, said front and rear portions adapted to contact the waist of an infant and said side portions adapted to go between the legs of the infant, each of said side portions being longer than each of said front and rear portions, said front, rear and side portions providing a fluid absorbing generally rectangular-shaped diaper portion including at least two layers of hypo-allergenic, non-woven material and at least one layer of soft, absorbent material sandwiched between said layers of hypo-allergenic, non-woven material, said fluid absorbing generally rectangular-shaped diaper portion being of minimum area so that only a minimum amount of skin area of a wearer is covered during therapy, said layers of hypo-allergenic, non-woven material having heat sealed outer peripheries;

at least one folded expansible reservoir means located in said generally rectangular-shaped diaper portion for providing a reservoir for holding urinal and fecal body waste material, each of said folded expansible reservoir means disposed substantially parallel to said side portions and substantially perpendicular to said front and rear portions and including:

(a) a first edge portion,

(b) a first rectangular portion which extends in a first direction perpendicular to said first edge portion to a downward first fold line, said downward first fold line being parallel to said first edge portion,

(c) a second rectangular portion connected to said first rectangular portion and extending in a second direction to a downward second fold line, said downward second fold line being parallel to said downward first fold line and located between said downward first fold line and said first edge portion,

(d) a third rectangular portion connected to said second rectangular portion and extending from said downward second fold line to an upward third fold line, said upward third fold line being parallel to said downward second fold line, one length of said third rectangular portion being approximately twice the corresponding length of said second rectangular portion,

(e) a fourth rectangular portion connected to said third rectangular portion and extending from said upward third fold line to a fourth upward fold line, said fourth upward fold line being parallel to said third upward fold line, one length of said fourth rectangular portion being approximately equal to the corresponding length of said second rectangular portion, and

(f) a fifth rectangular portion connected to said fourth rectangular portion and extending from said fourth upward fold line to a second edge portion, said second edge portion being parallel to said upward fourth fold line, and one length of said fifth rectangular portion being approximately equal to the corresponding length of said first rectangular portion; and

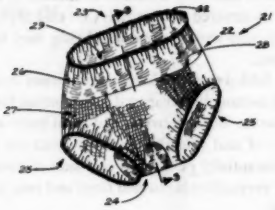
two continuous thin strap means of generally equal length heat sealed to said front and rear portions, respectfully, of said generally rectangular-shaped diaper portion and extending across each of said front and rear portions of said diaper portion for attaching said diaper portion to the infant in order to partially cover the buttock and genitalia of the infant by tying end portions of one of said two continuous thin strap means to end portions of the other of said two continuous thin strap means, said two continuous thin strap means being made out of a hypo-allergenic, non-woven material, each one of said two continuous thin strap means having a portion heat sealed to one of said front and rear portions of said generally rectangular-shaped diaper portion for permanently securing end portions of each of said folded expansible reservoir means to maintain a fixed pleated configuration.

4,560,381

DISPOSABLE PANTY FOR MENSTRUAL WEAR

Sandra R. H. Southwell, 1014 E. Pueblo, Phoenix, Ariz. 85020

Filed Jul. 7, 1983, Ser. No. 511,470
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—396 **59 Claims**



1. A disposable woman's protective menstrual panty for holding a feminine napkin comprising:

a relatively thick layer of disposable absorbent material; and

a depression means in said relatively thick layer of disposable absorbent material, said depression means including a substantially thinner layer of disposable absorbent material operably disposed longitudially in the crotch area of said panty and extending at least partially upward thereof in both front and rear areas, said depression means being dimensioned for receiving said feminine napkin therein for positioning same during use.

4,560,382

MEDICAL CONTAINER

Keinosuke Isono, Kawaguchi, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,537
Claims priority, application Japan, Aug. 15, 1983, 58-149019
Int. Cl.[4] A61B *5/00*
U.S. Cl. 604—408 **24 Claims**

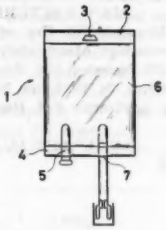
1. A medical container comprising a flexible vessel defining an interior space for containing a fluid, at least one inlet means provided across the wall of said vessel for admitting another fluid into the interior space for admixing, and outlet means for transferring the fluid out of the interior space, characterized in that said inlet means comprises

a tubular member extending through the vessel wall and defining a channel in communication with said interior space,

plugging means mounted on said tubular member for shutting off the channel in said tubular member from the exterior, and for permitting access to the tubular member channel from the exterior,

a bacterial filter member traversing said tubular member on the side of the interior space with respect to said plugging means, and

closure means mounted on said tubular member on the side of said interior space with respect to said filter member for



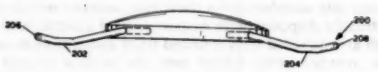
shutting off said filter member from said interior space, and for permitting communication of said interior space with said filter member when the other fluid is to be admitted into said interior space.

4,560,383

ANTERIOR CHAMBER INTRAOCULAR LENS

Larry G. Leiske, 1500 S. Central, Suite 221, Glendale, Calif. 91204

Filed Oct. 27, 1983, Ser. No. 545,829
Int. Cl.[4] A61F *1/16, 1/24*
U.S. Cl. 3—13 **6 Claims**



1. Anterior chamber lens comprising:

a. lens optic;

b. two opposing ramped U-shaped loops, each of said loops formed of a smooth, round, cylindrical member, and each of said loops including substantially rounded corners, each of said loops secured into opposing sides of said lens optic; and,

c. each of said loops including a kicked-up end means including an end portion of each of said loops angled upwardly a finite height whereby said loops provide three-dimensional stability and flexibility in both primary and secondary implantations with either intracapsular or extracapsular cataract extractions and said kicked-up end means prevents ovaling of a pupil of an eye and bowing of said lens forward in said eye.

4,560,384

PROCESS FOR TANNING HIDES

Sergio Vanni, S.Croce Sull'Arno, Italy; Loris Guidi, 55, Via di Poggio Adorno, S.Croce Sull'Arno, Pisa, Italy; Paolo Vallini, San Miniato, Italy; Renato C. Pace, Alessandria, Italy, and Carlo Scotti, Voghera, Italy, assignors to Loris Guidi, Pisa and Sibit S.p.A., Milan, both of, Italy

Filed Jun. 7, 1984, Ser. No. 618,220

Claims priority, application Italy, Jun. 10, 1983, 21550 A/83

Int. Cl.[4] C14C *5/00*

U.S. Cl. 8—94.21 10 Claims

1. A process for tanning hides for soles or insoles in which the hides, after having undergone soaking, liming, fleshing, and deliming, are tanned with ammonium titanyl sulphate, characterized in that the hides are first treated with ammonium sulphate; successively ammonium titanyl sulphate and citric acid or an alkali metal citrate are gradually added to the bath, maintaining the bath temperature at a value not exceeding 37° C. and the bath pH at values ranging from 1.7 to 2.5; after each addition the hides are treated until they absorb at least 90% of the soluble Ti (IV); a gradual addition of sodium sulphite and hexmethylenetetramine is then carried out, this addition being such as to bring the final pH of the bath to 3.8–4.5 and to exhaust the soluble Ti (IV) in the bath; $NaHCO_3$ is then added till reaching a pH of the bath ranging from 4.0 to 5.0, such pH being maintained for at least 2 hours; at least one tanning treatment with a tannin, either before the treatment with ammonium titanyl sulphate (pretanning), or after the treatment with $NaHCO_3$ (additional tanning) is carried out, said tanning being accomplished with a synthetic or a vegetable tannin in the former case, and with a synthetic tannin in the latter case.

4,560,385

PROCESS FOR THE TREATMENT OF NON-WOVEN SHEETS AND THE PRODUCT OBTAINED

Jean Baravian, Croissy sur Seine, France, assignor to Rhone-Poulenc Fibres, Lyons, France

Filed May 21, 1984, Ser. No. 612,345

Claims priority, application France, May 25, 1983, 83 08770

Int. Cl.[4] D06M *9/00*; D02G *3/00*

U.S. Cl. 8—115.7 10 Claims

1. A process for producing spunbonded non-woven textile sheet of continuous filaments of polyester and continuous filaments of polyamides which comprises

forming a spunbonded non-woven sheet of crimped continuous side-by-side polyester/polyamide filaments, said sheet having an overall linear density of less than 2 dtex;

needle bonding the spunbonded non-woven sheet using needles of gauge 38 to 42 possessing 2 to 3 barbs per needle, said barbs each being smoothed on 2 to 3 edges so that the number of perforations is in the range of from 100 to 1500 perforations per square centimeter;

contacting the needle bonded spunbonded sheet at a temperature of from 5° C. to 40° C. with an aqueous solution of a swelling agent consisting of formic acid at a concentration of from 50 to 70% whereby the sheet is contracted and the side-by-side filaments are at least partially separated into the continuous polyamide filaments and the continuous polyester filaments, each of said separated filaments having a denier of less than 1 dtex.

4,560,386

ONE-BATH METHOD FOR PRODUCING TONE-IN-TONE DYEINGS ON SUEDED WOOL- OR FUR-BEARING SKINS

Tony A. Hopkins, Basel, and Rudolf Seitz, Ormalingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Mar. 16, 1984, Ser. No. 590,478

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310153

Int. Cl.[4] D06P *1/38, 3/30*

U.S. Cl. 8—437 21 Claims

1. A method for dyeing sueded tanned wool- or fur-bearing skin material tone-in-tone which comprises treating the material in a single bath and in one step with an aqueous dyeing liquor containing

(i) a reactive dyestuff bearing at least one reactive group selected from acryloyl, halogenoacryloyl and β-halogenopropionyl groups which are bound through an unsubstituted or substituted imino group, or a mixture of such dyestuffs, and

(ii) a non-ionic or anionically modified polyalkoxylated surfactant or a mixture of such compounds.

4,560,387

AQUEOUS FORMULATIONS FOR DYEING AND PRINTING BLENDED FABRICS

Raymond Défago, Riehen, and Sabahattin Güz, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1985, Ser. No. 699,288

Claims priority, application Switzerland, Feb. 13, 1984, 679/84

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—527 9 Claims

1. An aqueous formulation comprising at least one water-insoluble or sparingly water-soluble dye and at least one fibre-reactive dye, and optionally further auxiliaries, which formulation contains a non-ionic water-soluble cellulose ether.

4,560,388

PROCESS FOR DYEING SILK OR FIBRE BLENDS CONTAINING SILK

Rudolf Rohrer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 11, 1984, Ser. No. 598,951

Claims priority, application Switzerland, Apr. 20, 1983, 2124/83

Int. Cl.[4] D06P *3/10*; C09B *62/00*

U.S. Cl. 8—543 19 Claims

1. A process for dyeing or printing silk fibres with a reactive dye, comprising the step of applying to the fibres a reactive dye of the formula

$$D—Y]_n$$

wherein D is a radical of a sulfo-group-containing dye of the monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazane, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylentetracarbimide series;

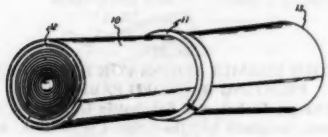
n is 1 to 4; and

Y is chloroacetyl, bromoacetyl, β-chloropropionyl, β-bromopropionyl, β-sulfatoethylsulfonamino, α,β-dichloropropionyl, α,β-dibromopropionyl, acryloyl, α-chloroacryloyl, α-bromoacryloyl, 2-methanesulfonyl-6-methylpyrimid-4-yl, 2,5,6-trichloropyrimid-4-yl, 2,5,6-tribromopyrimid-4-yl, 2-methanesulfonyl-5-chloro-6-methylpyrimid-4-yl, 2,4-dichloropyrimid-6-carbonyl, 2,4-dichloropyrimid-5-carbonyl, 6-fluoro-5-chloropyrimid-4-yl, 2,4-difluoro-5-chloropyrimid-6-yl, 2,5-difluoropyrimid-4-yl, 4,6-difluoro-s-triazine-2-yl, or 6-fluoro-s-triazine-4-yl substituted in 2-position by an aryl or alkyl radical or by the radical of an aliphatic or aromatic compound which is bonded through the sulfur atom or through the oxygen atom, or is substituted in 2-position by $—NH_2$ or by the radical of an aliphatic, heterocyclic or aromatic amino compound which is bonded through the nitrogen atom; Y may be the same or different when n is greater than 1; provided that when n is 1, Y is not chloroacetyl, α-bromoacryloyl or α,β-dibromopropionyl, and when n is 2 both Y are not chloroacetyl, α-bromoacryloyl, or α,β-dibromopropionyl; in aqueous medium at a temperature in the range of 50° to 130° C., and subsequently effecting dye fixation at pH 8 to 11.

4,560,389
COMBUSTIBLE NEWSPAPER LOG

James P. Steibel, 4822 - 57th Dr., Sturtevant, Wis. 53177

Filed Feb. 28, 1985, Ser. No. 706,763
Int. Cl.[4] C10L 5/36
U.S. Cl. 44—1 R 1 Claim



1. A combustible newpaper log comprised in a cylindrical roll of newspaper with a longitudinal axis of at least 10 inches and a diameter of at least 3 inches, a length of a strip of iron metal having two free ends and being circularly shaped into a ring with said ends adjacent each other but spaced apart to form a ring of an internal diameter of at least 3 inches and a length of at least ½ inch and said strip having a cross-sectional thickness of at least 3/16 inch, said ring surrounding said roll and disposed centrally along the length of said roll for holding the newspaper in the cylindrical shape, said ring being made from flat stock iron metal and rolled into the circular shape and being non-distortable when completely surrounded by combustion simultaneously generated by a plurality of said logs for a period of at least 20 minutes.

4,560,390
METHOD OF BENEFICIATING COAL

Robert Bender, 325 Castlegate Rd., Pittsburgh, Pa. 15221

Filed Sep. 22, 1983, Ser. No. 534,618
Int. Cl.[4] C10L 9/02
U.S. Cl. 44—15 R 10 Claims

1. A process for reducing the sulfur and ash content of coal comprising the steps of:

(a) cleaning the coal to remove debris;

(b) pulverizing the coal;

(c) contacting the coal without external application of heat or pressure for on the order of 2 minutes or less with a reagent selected from the group consisting of aqueous solutions of active nitrogen containing compounds, aqueous solutions of organic compounds containing at least one hydroxyl group, surfactants containing active ammonium groups and combinations thereof;

(d) washing the coal with water; and

(e) drying the coal.

4,560,391
ALTERNATIVE FUEL COMPRISED OF SEWAGE SLUDGE AND A LIQUID HYDROCARBON FUEL OIL

Robert A. Ashworth, Tampa, Fla., assignor to Florida Progress Corporation, St. Petersburg, Fla.

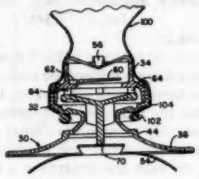
Filed May 31, 1984, Ser. No. 615,725
Int. Cl.[4] C10L 1/32
U.S. Cl. 44—51 14 Claims

1. An improved fuel composition comprising from about 5 to 25 percent by weight of non-dewatered sewage sludge comprising from about 92 to 99.5 percent by weight of water with the remainder comprising solids and from about 75 to 95 percent by weight of an organic fuel comprised of a fuel oil.

4,560,392
NOISE MAKING BALLOON VALVE

John L. Basevi, c/o Apartment 031913, Block 126, Avenue 3, Ang Mo Kio, Singapore 2056

Filed Nov. 22, 1983, Ser. No. 554,329
Int. Cl.[4] A63H 29/10, 5/00, 3/06
U.S. Cl. 446—186 15 Claims



1. A valve for insertion in the neck of a toy balloon, comprising:

a casing having a balloon-engagable first end and a user-accessible opposite end, the casing defining a flow path and having an internal annular surface defining a valve seat, the casing being flared at the user-accessible end to form a trumpet, the casing supporting the balloon at the first end when placed with the trumpet on a support surface, and the trumpet having a large diameter with respect to a child's mouth and remaining portions of the casing;

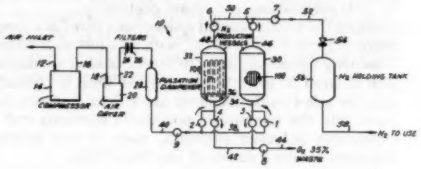
a valve body disposed in the casing and movable between a closed position in which the valve body rests against the valve seat to seal the flow path, and an open position in which the valve body is moved away from the valve seat to open the flow path, the valve body being biased by gas pressure to the closed position when the balloon is inflated; and,

a resonant reed mounted in the casing and operable to emit a noise in response to flow.

4,560,393
METHOD OF AND ARRANGEMENT FOR ENRICHING THE NITROGEN CONTENT OF AN EFFLUENT GAS IN A PRESSURE SWING ADSORPTION SYSTEM

James Way, Cupertino, Calif., assignor to Nitrotec Corporation, New York, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,526
Int. Cl.[4] B03C 3/14; B01D 53/04
U.S. Cl. 55—5 14 Claims



1. In an adsorption process of the type wherein a feed gas comprised of two components is loaded in an adsorber operative for selectively adsorbing one of the components, and an effluent gas enriched in the other of the components is conveyed from the adsorber,

a method of increasing the enrichment of said other component contained in the effluent gas, comprising the steps of:

(a) differentially electrostatically charging the two components of the feed gas to electrostatically charge said one component greater than said other component with a charge having a first polarity; and

(b) electrostatically charging the adsorber during loading thereof with a charge having a second opposite polar-

ity, thereby electrostatically to attract said greater charged one component to said oppositely charged adsorber during the loading thereof.

7. In an adsorption system of the type wherein a feed gas comprised of two components is loaded in an adsorber operative for selectively adsorbing one of the components, and an effluent gas enriched in the other of the components is conveyed from the adsorber, an arrangement for increasing the enrichment of said other component contained in the effluent gas, comprising:

(a) means for differentially electrostatically charging the two components of the feed gas to electrostatically charge said one component greater than said other component with a charge having a first polarity; and

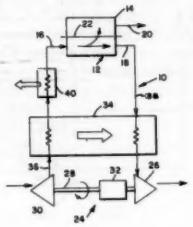
(b) means for electrostatically charging the adsorber during loading thereof with a charge having a second opposite polarity, thereby electrostatically to attract said greater charged one component to said oppositely charged adsorber during the loading thereof.

4,560,394

OXYGEN ENRICHMENT SYSTEM

George H. McDonald, Palos Verdes Estates, and Scott A. Manatt, Granada Hills, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 18, 1981, Ser. No. 332,395
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **12 Claims**



1. A continuous oxygen enrichment system comprising:

a compressor for producing a supply of pressurized air;

membrane means for continuously dividing said supply of pressurized air into oxygen-enriched and oxygen-depleted streams;

a turbine rotatably driven by said oxygen-depleted stream, said turbine operably connected to said compressor to drive the latter; and

a regenerative heat exchanger between said compressor and said membrane means for transferring heat from said supply to said oxygen-depleted stream at a location upstream of said turbine.

10. A method for continuously producing a stream of oxygen-enriched gas from air comprising:

compressing a supply of air;

separating the compressed supply of air into oxygen enriched and oxygen-depleted streams;

driving a turbine by said oxygen-depleted stream to produce mechanical energy;

utilizing said mechanical energy to at least assist in said compressing step; and

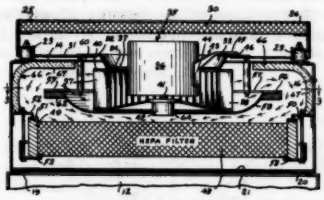
transferring heat from the compressed supply of air to the oxygen-depleted stream.

4,560,395

COMPACT BLOWER AND FILTER ASSEMBLIES FOR USE IN CLEAN AIR ENVIRONMENTS

George B. Davis, Frederick, Md., assignor to Environmental Air Control, Inc., Hagerstown, Md.

Continuation-in-part of Ser. No. 601,398, Apr. 17, 1984, abandoned. This application Nov. 30, 1984, Ser. No. 676,917
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—276 **24 Claims**



1. A compact air purification apparatus for providing clean airflow to a clean air enclosure comprising a primary housing having first and second end portions and substantially closed sidewall portions, inlet and discharge openings disposed through said first and second end portions, respectively, a blower means mounted through said inlet opening so as to extend inwardly of said primary housing, said blower means having a motor drivingly connected to a centrifugal fan means, said centrifugal fan being disposed within said primary housing so as to discharge air radially outwardly with respect to said inlet opening, said centrifugal fan including a plurality of radially extending blade means, a filter means mounted within said primary housing adjacent said discharge opening so that all airflow outwardly of said primary housing through said discharge opening passes through said filter means, a first baffle means disposed adjacent said centrifugal fan means and between said centrifugal fan means and said filter means, said first baffle means having outwardly extending wall portions which extend outwardly of said centrifugal fan means toward said sidewalls of said primary housing so as to create an airflow space radially of said centrifugal fan means between said first baffle means and said sidewalls of said primary housing, second baffle means disposed radially outwardly of said centrifugal fan means and said first baffle means, said second baffle means having inner surfaces for directing the airflow from said centrifugal fan means inwardly of said primary housing and between said first baffle means and said filter means whereby air being introduced into said housing by said centrifugal fan means will be directed radially outwardly of said centrifugal fan means and guided by said first baffle means towards said second baffle means and thereafter by said second baffle means between said first baffle means and said air filter means.

4,560,396

DOWN FLOW FILTER PANEL DUST COLLECTOR

Leonard J. O'Dell, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 20, 1984, Ser. No. 642,589
Int. Cl.[4] B01D *41/02*
U.S. Cl. 55—287 **11 Claims**

1. In a dust collector for removing particulates from a dirty gas stream comprising:

a housing having partition means dividing said housing into a vertically extending dirty gas chamber having a dirty gas inlet and a clean gas chamber having a clean gas outlet, said partition means having aperture means therethrough connecting said dirty gas chamber in gas flow communication with said clean gas chamber,

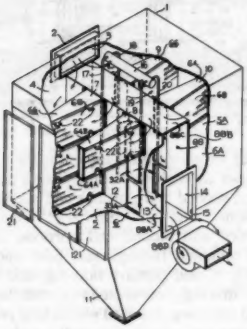
said dirty gas chamber including an inlet plenum zone adjacent the top of said housing and having said dirty gas inlet therein, a quiet zone adjacent the bottom of said housing

and a filtering zone between said plenum and quiet zones having a filter assembly operatively mounted therein including filter means to filter said dirty gas stream flowing through said aperture means,

the improvement comprising said filter means having a flat filter surface orientated vertically and parallel to a downward flow of said dirty gas stream and the particulates therein through said filtering zone,

said quiet zone being below and in direct vertical alignment with said flat vertically orientated filter surface,

said filter surface vertical orientation allowing said dirty gas stream to flow straight downwardly through said filtering



zone to impart downwardly directed inertia forces to said particulates which combine with gravitational forces on said particulates to maximize the amount of said particulates that pass through said filtering zone into said quiet zone without depositing on said filters, and

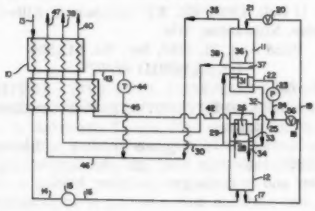
filter cleaning means for dislodging some of those particulates that do deposit on said filter surface back into the dirty gas stream flowing downwardly parallel to the filter surface to permit said dirty gas stream to reimpart inertia forces to the particulates which combine with gravitational forces to cause some of said dislodged particulates to pass through said filtering zone without redepositing in said filter surface.

4,560,397

PROCESS TO PRODUCE ULTRAHIGH PURITY OXYGEN

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 16, 1984, Ser. No. 641,205
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—28 **33 Claims**



1. A cryogenic air separation process for the production of elevated pressure nitrogen, and ultrahigh purity oxygen containing no more than 100 ppm of impurities, comprising:

(A) introducing cleaned cooled feed air into a primary column operating at a pressure in the range of from 40 to 200 psia;

(B) separating said feed air in said primary column into a nitrogen-rich vapor and an oxygen-rich liquid;

(C) recovering a first portion of said nitrogen-rich vapor as elevated pressure nitrogen gas;

(D) providing reflux liquid for the primary column;

(E) introducing a first portion of said oxygen-enriched liquid as feed into a secondary column operating at a pressure in the range of from 15 to 75 psia;

(F) separating said feed in said secondary column into a vapor fraction and a liquid fraction;

(G) withdrawing a first portion of said liquid fraction from said secondary column;

(H) vaporizing a second portion of said liquid fraction to provide reflux vapor for said secondary column;

(I) withdrawing a vapor stream from said secondary column at a point above at least one equilibrium stage above the vaporizing second liquid portion of step (H); and

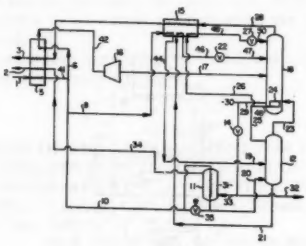
(J) recovering said withdrawn vapor stream as product ultrahigh purity oxygen generally suitable for use in such as the electronics industry and having no more than 100 ppm of impurities.

4,560,398

AIR SEPARATION PROCESS TO PRODUCE ELEVATED PRESSURE OXYGEN

Robert A. Beddome, and Harry Cheung, both of Kenmore, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 6, 1984, Ser. No. 628,312
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—29 **13 Claims**



1. In a process for the separation of feed air by countercurrent liquid vapor contact in a higher pressure column and a lower pressure column which are in heat exchange relation at a region where vapor from the higher pressure column cools to warm liquid from the lower pressure column, the improvement, enabling efficient production of oxygen gas at a pressure greater than that of the lower pressure column without the need for compressing oxygen gas or pumping oxygen liquid from the lower pressure column to a higher pressure, comprising

(A) withdrawing liquid from said region of heat exchange relation and passing the withdrawn liquid to an elevation lower than said region of heat exchange relation to create a hydrostatic head and thereby increase the pressure of the withdrawn liquid;

(B) vaporizing said withdrawn liquid at the elevated pressure caused by said hydrostatic head by indirect heat exchange with the major portion of the feed air, which is at a pressure substantially the same as that of the higher pressure column, to partially condense said feed air, thereby effecting a first separation step of the major portion of the feed air;

(C) introducing at least some of the vapor portion of said partially condensed major portion of the feed air into said higher pressure column; and

(D) recovering at least some of the vapor formed in step (B)

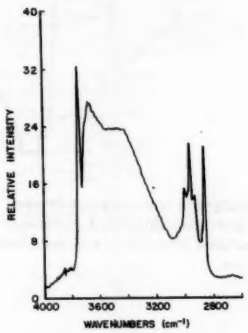
at a pressure which exceeds that of the lower pressure column.

4,560,399

METHOD FOR MAKING GLASS OR CERAMIC ARTICLE

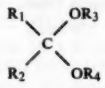
John C. Luong, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,160
Int. Cl.[4] C03B *19/06*
U.S. Cl. 65—18.1 11 Claims



1. In the method for making a glass or ceramic article which comprises the steps of dispersing submicron-sized oxide particles in a non-aqueous vehicle to provide an oxide suspension, forming the suspension into a shaped configuration for the article and causing it to gel in that shaped configuration by the addition of a gelling agent, drying the gelled shape to remove the vehicle therefrom, and sintering the dried shape to provide a unitary glass or ceramic article, the improvement wherein:

the submicron-sized oxide particles are treated prior to dispersion in the non-aqueous vehicle with a dehydrating agent consisting of a ketal compound, that compound being of the structure



wherein R_1–R_4 are alkyl groups of from 1–4 carbon atoms.

4,560,400

FERTILIZER COMPOSITIONS, PROCESSES OF MAKING THEM AND PROCESSES OF USING THEM

G. Graham Allan, Seattle; Donald E. Freepons, Kennewick, both of Wash., and George M. Crews, Baton Rouge, La., assignors to Melamine Chemicals, Inc., Donaldsonville, La.

Continuation of Ser. No. 305,603, Sep. 25, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,023
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] C05C *9/00*
U.S. Cl. 71—29 5 Claims

1. A granular fertilizer product that in the soil is a source of nitrogen fertilizer values, the granules of said product being suitable for mechanical dispensing for application to and into the soil, said granules consisting of a mixture comprising:

particles of a material selected from the group consisting of melamine, the mineral acid salts of melamine, and mixtures thereof, said particles having individual particle sizes not above 400 micrometers in largest dimension, in an amount from 10% to 67% by weight of said granules, and

an effective binding amount by weight of the granules, of a urea binder that binds said particles in a form which is granular, the amount of said urea binder being from 33% to 90% by weight of said granules,

said granules having been formed by heating said mixture above the melting point of urea, then cooling to solidify the urea so as to bind said particles in said urea, said urea binder, after distribution of the granules in the soil, permitting the action of water and microorganisms on said particles,

said granules being suitable in granule strength and weight for mechanical dispensing and for application to or into the soil, the average crush strength of a sample of said granules, selected to have sizes of 3 mm. to 4 mm., being at least one pound per granule.

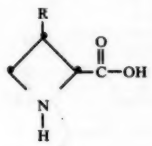
4,560,401

METHOD FOR STERILIZING MALE PARTS OF PLANTS

Barry R. J. Devlin, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 395,401, Jul. 6, 1982, abandoned, and a continuation of Ser. No. 289,552, Aug. 3, 1981, abandoned, and a continuation of Ser. No. 201,107, Oct. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 395,526, Jul. 6, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 523,226
Claims priority, application United Kingdom, Nov. 16, 1979, 7939781
Int. Cl.[4] A01N *43/00*
U.S. Cl. 71—88 7 Claims

1. A method for producing male sterility in a cereal grain plant without substantial effect on the female fertility of the plant, which comprises applying to the plant an effective dosage of an azetidine of the formula



wherein R is alkyl of one to four carbon atoms, or a salt thereof.

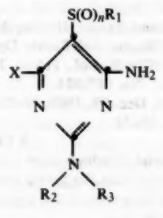
4,560,402

2,4-DIAMO-5-(ALKYLSULFINYL) OR ALKYLSULPHONYL)-6-HALOPYRIMIDINES

Karl Hoegerle, Basel, and Hans Tobler, Allschwil, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Aug. 4, 1980, Ser. No. 174,983
Claims priority, application Switzerland, Aug. 15, 1979, 7478/79; Aug. 15, 1979, 7479/79
Int. Cl.[4] C07D *239/24;* A01N *43/54*
U.S. Cl. 71—092 9 Claims

1. A pyrimidine of the formula I



(I)

wherein n is 1 or 2, R_1 is C_1–C_4alkyl, each of R_2 and R_3 is

hydrogen, C_1-C_6alkyl or C_3-C_6cycloalkyl, and X is chlorine, bromine or fluorine.

4,560,403

CYCLOHEXANE DERIVATIVES HAVING PLANT-GROWTH REGULATING ACTIVITIES, AND USES OF THESE DERIVATIVES

Kenji Motojima, Kakegawa; Takeshige Miyazawa, Shizuoka; Yasufumi Toyokawa, Shizuoka; Masafumi Matsuzawa, Shizuoka; Hiroshi Hokari, Shizuoka, and Shoji Kusano, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

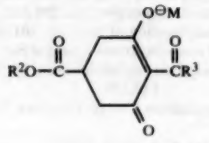
Filed Sep. 22, 1983, Ser. No. 534,827

Claims priority, application Japan, Apr. 22, 1983, 58-71264

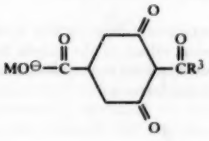
Int. Cl.[4] A01N *37/08, 37/42;* **C07C** *87/30, 91/26, 62/38, 69/757*

U.S. Cl. 71—106 **6 Claims**

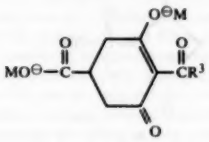
1. A compound being a salt of a 3,5-dioxo-cyclohexanecarboxylic acid compound and selected from the group consisting of the salts represented by one of the following formulas:



(Ib)



(Ic)



(Id)

wherein R_2 represents a hydrogen atom or an alkyl group, R^3 represents an alkyl group and M represents an alkyl substituted ammonium cation, a hydroxyalkylsubstituted ammonium cation, an alkyl-substituted and hydroxyalkyl-substituted ammonium cation or an alkenyl-substituted ammonium cation.

6. A method of regulating the growth of plant, which comprises applying a plant-growth-regulatingly effective amount of a salt of a 3,5-dioxo-cyclohexanecarboxylic acid compound represented by the formula (Ib), (Ic) or (Id) as defined in claim 1, to the foliage or seed of the plant to be treated or to the soil or locus where the plant to be treated is grown.

4,560,404

METHOD OF PRODUCING MATERIAL FOR SUPERCONDUCTOR

Katsuzo Aihara, Hitachiohta; Naofumi Tada, Hitachi; Yasuo Suzuki, Takahagi; Joo Ishihara, Hitachi, and Toshio Ogawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,914

Claims priority, application Japan, Dec. 29, 1983, 58-247686

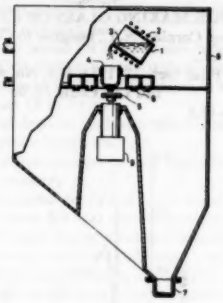
Int. Cl.[4] H01L *39/24*

U.S. Cl. 75—0.5 C **9 Claims**

1. A method of producing a material of which main components are Cu and one element selected from the group consisting of Nb and V and which is used for producing a superconductor, which comprises the steps of:

melting, under vacuum, raw materials of Cu and one element from the group consisting of Nb and V at a predetermined ratio, to form a melt;

scattering said melt to form a plurality of fine droplets; and



cooling rapidly said scattering fine droplets to solidify them thereby providing integrated particulate bodies each of which includes particles of said one element dispersed in the Cu base.

4,560,405

PROCESS FOR DESULFURIZING MOLTEN STEEL

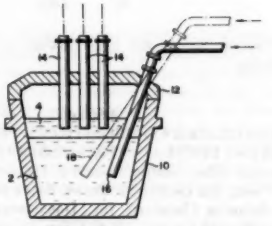
Yoshiharu Miyawaki, Fukuyama; Masayuki Hanmyo, Tokyo; Yusuke Shiratani, Fukuyama; Yasuhiro Matsuda, Hiroshima; Yoshimi Komatsu, Fukuyama; Tsuneo Kondo, Fukuyama, and Tsutomu Usui, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,565

Claims priority, application Japan, Sep. 3, 1984, 59-184154

Int. Cl.[4] C21C *5/52*

U.S. Cl. 75—12 **7 Claims**

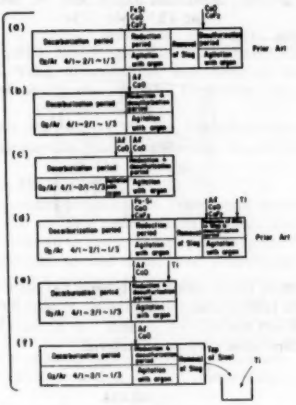


1. A process for desulfurizing molten steel comprising the steps of: removing converter slag from molten steel; adding a desulfurizing flux onto the molten steel from which the converter slag has been removed; the desulfurizing flux being melted to a slag consisting essentially of 53 to 62 wt.% of CaO, 0 to 15 wt.% of SiO_2, and 30 to 45 wt.% of Al_2O_3; supplying power to electrodes at a predetermined distance from the molten steel so as to generate an electric arc, the desulfurizing flux being melted by arc-heating so as to form the slag; and introducing a gas into the molten steel through a lance submerged into the molten steel to stir the molten steel and the slag which are arc-heated.

4,560,406
PROCESS FOR REFINING OF CHROMIUM-CONTAINING MOLTEN STEEL

Yasunobu Ikehara; Haruki Ariyoshi, and Ryoichi Hidaka, all of Hikarishi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,784
Claims priority, application Japan, Dec. 2, 1983, 58-227887
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—30 6 Claims

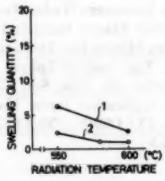


1. A process for refining chromium-containing molten steel by decarburization reduction and desulfurization, which comprises adding to slag existing after completion of said decarburization, metallic Al as a reducing agent and CaO as a slag-forming agent respectively in amounts necessary for said slag, after completion of the subsequent reduction, to acquire a SiO_2 content of not more than 10% and a CaO/Al_2O_3 ratio in the range of 0.8 to 2.0, thereby enabling said reduction and desulfurization to proceed simultaneously.

4,560,407
ALLOY FOR USE IN A RADIOACTIVE RAY ENVIRONMENT AND REACTOR CORE MEMBERS

Toshimi Yoshida, Katsuta; Kiyotomo Nakata, Hitachi; Isao Masaoka, Hitachi, and Hisawo Itow, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,211
Claims priority, application Japan, Mar. 20, 1981, 56-40666; Sep. 9, 1981, 56-141034
Int. Cl.[4] C22C *39/14*
U.S. Cl. 75—128 N 2 Claims



1. A reactor core member made of an austenite stainless steel and installed in the core portion exposed to neutron radiation of at least 10^{16} nvt, said austenite stainless steel having a full austenite structure and consisting essentially of not more than 0.03% by weight of carbon, 0.05 to 0.2% by weight of nitrogen, 15 to 20% by weight of chromium, 10 to 15% by weight of nickel, 2.0 to 3.0% by weight of molybdenum, up to 1% by weight of silicon, up to 2% by weight of manganese, and the balance iron, the nitrogen acting to reduce radiation damage of the steel, whereby embrittlement of the member by neutron radiation is substantially prevented.

4,560,408
METHOD OF USING CHROMIUM-NICKEL-MANGANESE-IRON ALLOY WITH AUSTENITIC STRUCTURE IN SULPHUROUS ENVIRONMENT AT HIGH TEMPERATURE

Per H. Wilhelmsson, Ekostigen, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Jun. 1, 1984, Ser. No. 616,299
Claims priority, application Sweden, Jun. 10, 1983, 8303301
Int. Cl.[4] C22C *38/58*
U.S. Cl. 75—128 A 2 Claims

1. In a process using a construction material in a sulphurous environment at a temperature of at least 300° C., in which the sulphurous environment consists of flue gases or similar media being formed by combustion or equivalent operations of fuels having a sulphur content of at least 0.2%, the improvement which comprises using as the construction material a chromium-nickel-manganese-iron alloy with austenitic structure consisting essentially of (in % by weight):

C	0.03–0.12
Si	0.05–1.0
Mn	3–8
Cr	18–25
Ni	27–35
W, Mo, V, Ta	in total, <3
Nb	0.2–1.8
Ti	up to 0.5
Al	up to 0.5
B	<0.008
N	0.01–0.15
Zr	<0.05
Co	up to 10
Fe	rest (besides usual impurities).

4,560,409
METAL BEARING GRAPHITIC CARBONS

William M. Goldberger, and Allan Reed, both of Chicago, Ill., assignors to Superior Graphite, Chicago, Ill.

Filed Aug. 29, 1984, Ser. No. 645,331
Int. Cl.[4] C22C *33/08;* C01B *31/04*
U.S. Cl. 75—130 R 24 Claims

10. An iron inoculant material comprising:

a free flowing, granular, low sulfur graphitic material having a non-carbonaceous material diffused within the structure of the graphitic material, said non-carbonaceous material being selected from the group consisting of aluminum, boron, calcium, strontium, barium, titanium, magnesium, zirconium, and the lanthanide series elements.

4,560,410

FOUNTAIN SOLUTIONS SUITABLE FOR USE IN LITHOGRAPHIC OFFSET PRINTING

Richard J. Burns, Piscataway; Friso G. Willeboordse, Warren Township, Union County, both of N.J., and Martin F. Cohen, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 264,076, May 18, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 503,649

Int. Cl.⁴ C09K *3/18*

U.S. Cl. 106—2 **8 Claims**

1. An improved fountain solution suitable for use in a lithographic offset printing press which solution contains between 0.5 and about 10% by volume of a mixture of a polyol and/or glycol ether partially soluble in water, partial solubility characterized as having a solubility in water at 20° C. of between about 0.99 to about 28 weight percent, and a polyol and/or glycol ether completely soluble in water.

4,560,411

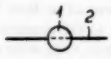
AGGREGATE FOR CONCRETE OR MORTAR

Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to BM Chemie Kunststoff GmbH, Wermelskirchen, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,496

Int. Cl.⁴ C04B *7/35*

U.S. Cl. 106—90 **16 Claims**



1. In a granular concrete and mortar composition, the improvement comprising using a granular concrete and mortar aggregate which consists of a body traversed by at least one filament whose length is greater than that of the body and whose diameter is smaller than that of the body so that portions of the filament whose lengths are greater than that of the portion of the filament within the body project from opposite sides of the body.

4,560,412

WHITE CEMENT PRODUCTION

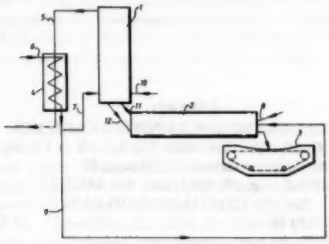
Paul Weber, Oelde, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,816

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312029

Int. Cl.⁴ C04B *7/08*

U.S. Cl. 106—101 **4 Claims**



1. In a method of producing white cement wherein raw material is precalcined in a preheater by hot exhaust gases from a kiln and the preheated raw material is fired in the kiln, the improvement including maintaining a reducing atmosphere in said kiln over the entire length thereof, and introducing fuel to the preheater in sufficient quantity to burn CO contained in the kiln exhaust gases.

4,560,413

GAMMA-DICALCIUM SILICATE-CONTAINING CEMENT COMPOSITION

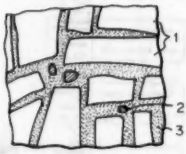
Shigehide Takagi; Norio Yokota, both of Narashino; Syohei Sato, Funabashi, and Toshihiro Nishi, Narashino, all of Japan, assignors to Sumitomo Cement Co., Ltd., Tokoyo, Japan

Filed May 21, 1984, Ser. No. 612,299

Claims priority, application Japan, May 30, 1983, 58-94031

Int. Cl.⁴ C04B *7/34*

U.S. Cl. 106—120 **12 Claims**



1. A cement composition comprising 100 parts by weight of a hydraulic cement material containing at least 60% by weight of γ-dicalcium silicate (γ-C_2S) and 1 to 20 parts by weight of a water-dispersible polymeric material.

4,560,414

MODIFIER FOR PAVING ASPHALT

Shinko Kikegawa, Koganei; Takao Arai, Sayama; Norio Yamamoto, Omiya, and Kiyoharu Ozaki, Tokyo, all of Japan, assignors to Nippon Hodo Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,651

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—281 R **14 Claims**

1. A modifier for paving asphalt, which consists essentially of a mixture of granulated Trinidad Epuré having a maximum size of less than 25 mm, and a pulverulent solid for preventing recaking of said granulated Trinidad Epuré during storage thereof, said pulverulent solid having a maximum size of less than 2.5 mm, a higher softening point than said granulated Trinidad Epuré and compatibility with paving petroleum asphalt, wherein the volume of said pulverulent solid is 0.8 to 2.8 times the void volume of the granulated Trinidad Epuré when in the stored state, and further wherein said pulverulent solid is selected from one or more members of the group consisting of asphaltite powder, asphalt pitch powder, polymeric resin powder, paving limestone powder, and mineral powder.

4,560,415

LIQUID COMPOSITION FOR ARTIFICIAL PRODUCTION OF VERDIGRIS

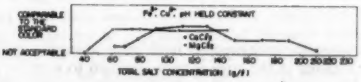
Shiro Koh, Tokyo; Katsuyasu Wada, Hachioji; Kazuhiko Namioka, Hachioji, and Masuo Hitomi, Hachioji, all of Japan, assignors to Dowa Mining Co., Ltd. and Dowa Metal Developing Center Co., Ltd., both of Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 665,785

Claims priority, application Japan, Nov. 1, 1983, 58-203620

Int. Cl.⁴ C09D *1/00*; **C04B** *31/00*

U.S. Cl. 106—286.3 **3 Claims**


COMPARABLE TO THE STANDARD COLOR
NOT ACCEPTABLE
• CaCl2
• MgCl2
40 60 80 100 120 140 160 180 200 220 230
TOTAL SALT CONCENTRATION (g/l)

1. A liquid composition for artificial production of verdigris

comprising an aqueous solution of an iron salt and a copper salt, said composition being acidic due to the presence of free hydrochloric acid, said iron and copper salts being dissolved in water in such amounts that dissolved iron is not more than 5.0 g/L and dissolved copper is not more than 20 g/L, said aqueous solution having also dissolved therein at least one alkaline earth metal salt in such an amount that it is effective as a humectant, the total amount of the dissolved iron salt, copper salt and alkaline earth metal salt being in the range of 40–200 g/L and said aqueous solution having a pH of 2.0 or less as measured with a pH meter.

4,560,416

HYDROLYZED DASHEEN STARCH FLOCCULANTS

Raymond N. Yong, Beaconsfield, and Amar J. Sethi, Baie d'Urfe, both of Canada, assignors to Suncor, Inc., Toronto, Canada

Division of Ser. No. 562,354, Dec. 16, 1983, Pat. No. 4,502,960. This application Nov. 19, 1984, Ser. No. 672,535

Int. Cl.⁴ C08B *30/12*

U.S. Cl. 127—33 **3 Claims**

1. A composition comprising a hydrolyzed dasheen starch obtained by the aqueous hydrolysis of dasheen starch in the presence of about 10 to about 30 gms per 100 gms of starch of insoluble metal salts formed in situ, and wherein the salts employed during the hydrolysis to form said insoluble salts are the soluble salts of metals selected from the group consisting of sodium, potassium, ammonium, magnesium, calcium and aluminum, and the respective anions of said soluble salts are selected from the group consisting of sulfates, acetates, chlorides, nitrates, chlorates, bromides, iodides, thiocyanates, and phosphates.

4,560,417

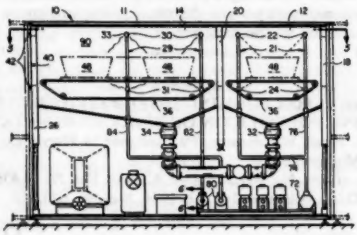
DECONTAMINATION METHOD FOR SEMICONDUCTOR WAFER HANDLING EQUIPMENT

Juan Bardina, Menlo Park, and Mikel Gonzalez, San Jose, both of Calif., assignors to Technomex Development, Ltd., Mountain View, Calif.

Division of Ser. No. 335,765, Dec. 30, 1981, Pat. No. 4,437,479. This application Feb. 27, 1984, Ser. No. 571,712

Int. Cl.⁴ B08B *3/02*

U.S. Cl. 134—1 **7 Claims**



1. A method of decontaminating semiconductor wafer handling equipment, comprising the steps of:

providing contaminated semiconductor wafer handling equipment;

loading the contaminated handling equipment in a first chamber;

thereafter sealing the first chamber;

applying decontamination liquid to the contaminated handling equipment in the first chamber;

thereafter unsealing the first chamber;

thereafter moving the decontaminated handling equipment into a second chamber in a manner introducing only the decontaminated handling equipment into the second chamber;

sealing the second chamber with the decontaminated handling equipment therein;

drying the decontaminated handling equipment in the second chamber; and

thereafter unloading the second chamber.

4,560,418

WHEELED SUCTION CLEANERS

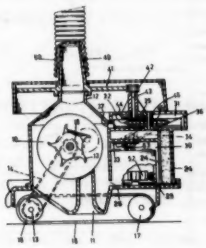
Johann N. Raubenheimer, Bedfordview, South Africa, assignor to Peacock Investments (Proprietary) Limited, Johannesburg, South Africa

Filed Sep. 14, 1983, Ser. No. 532,176

Claims priority, application South Africa, Sep. 20, 1982, 82/6889

Int. Cl.⁴ B08B *5/04*

U.S. Cl. 134—18 **8 Claims**



1. A method of applying steering forces to a wheel-supported suction head for cleaning submerged surfaces which is connected to a suction system by means of a flexible suction hose, is connected to the hose along a connecting axis normal to the surface to be cleaned and has wheels driven by a drive motor actuated by liquid flowing through the head to the hose with the improvements of causing the liquid to flow continuously through the head to the hose, causing a rotor of the drive motor in addition to driving the wheels to continuously drive an eccentric weight which imparts a rocking motion to the head, so that from time to time adhesion of the head to the surface is disturbed and any steering force can take effect more readily, and intermittently applying a torque about the connecting axis.

4,560,419

METHOD OF MAKING POLYSILICON RESISTORS WITH A LOW THERMAL ACTIVATION ENERGY

Ronald R. Bourassa, and Douglas B. Butler, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Filed May 30, 1984, Ser. No. 615,166

Int. Cl.⁴ H01L *21/263, 21/26, 21/425*

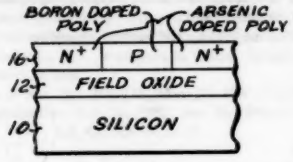
U.S. Cl. 148—1.5 **21 Claims**

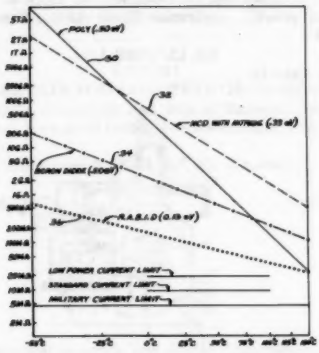
1. A method for fabricating a resistor in polysilicon for a semiconductor integrated circuit comprising:

doping a first region of polysilicon with one electrical type of doping impurity;

doping a second region of polysilicon adjacent to said first region with the other electrical type of doping impurity to

form a polysilicon structure with first and second regions; and





lowering the resistivity and thermal activation energy of the polysilicon structure below 0.20 eV by heat treating the polysilicon structure.

4,560,420

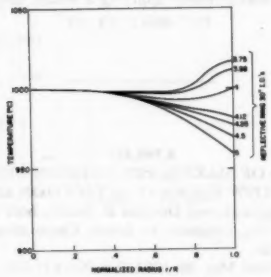
METHOD FOR REDUCING TEMPERATURE VARIATIONS ACROSS A SEMICONDUCTOR WAFER DURING HEATING

Herbert A. Lord, East Windsor Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 13, 1984, Ser. No. 620,246

Int. Cl.[4] H01L *21/265*

U.S. Cl. 148—1.5 **3 Claims**



1. A method for achieving lateral growth over oxide or a semiconductor wafer having first and second major surface comprising the steps of:

exposing only the first surface of the wafer to a source of radiant energy; and

providing a body spaced from the second surface of the wafer distal from the source of radiant heat energy for reflecting radiant heat energy towards selected areas of the wafer to reduce temperature variations thereacross.

4,560,421

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

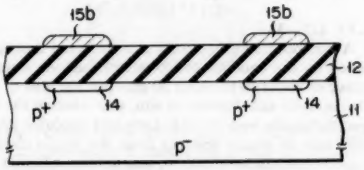
Satoshi Maeda, Kawasaki, and Hiroshi Iwai, Takaidonishi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 2, 1981, Ser. No. 307,877

Claims priority, application Japan, Oct. 2, 1980, 55-137912; Oct. 2, 1980, 55-137913; Feb. 4, 1981, 56-15533; Apr. 28, 1981, 56-65028; Apr. 28, 1981, 56-65029; Apr. 28, 1981, 56-65030; May 1, 1981, 56-66475; May 1, 1981, 56-66476; Sep. 1, 1981, 56-137238; Sep. 3, 1981, 56-138831; Sep. 3, 1981, 56-138832; Sep. 3, 1981, 56-138833

Int. Cl.[4] H01L *21/265*

U.S. Cl. 148—1.5 **30 Claims**



1. A method of manufacturing a semiconductor device, comprising:

(a) a step of forming a field region formation insulating film on a semiconductor substrate;

(b) a step of forming a mask pattern covering a portion of said insulating film corresponding to an intended element region;

(c) a step of ion implanting a field inversion prevention impurity into an intended element isolation region of said substrate with said mask pattern as a shield;

(c') a step of forming a protective film as an etch stop on said field region formation insulating film; and

(d) a step of removing a portion of said insulating film beneath said mask pattern, thereby forming an element isolation region on the substrate.

4,560,422

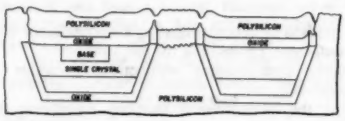
METHOD FOR FORMING INTEGRATED CIRCUITS BEARING POLYSILICON OF REDUCED RESISTANCE

Vipin N. Patel, Wyomissing, Pa., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 447,287, Dec. 6, 1982, Pat. No. 4,475,955. This application Jun. 21, 1984, Ser. No. 623,073

Int. Cl.[4] H01L *29/72*

U.S. Cl. 148—33 **5 Claims**



1. An integrated circuit device precursor, comprising: a substrate having regions of lower and higher energy beam reflection characteristics, wherein said regions of higher energy beam reflection characteristics are dielectrically isolated islands, and said regions of lower energy beam reflection characteristics are interisland areas of polycrystalline silicon positioned therebetween; and a layer of energy beam annealed

polysilicon overlaying at least a portion of said regions of lower and higher energy beam reflection characteristics, said layer of energy beam annealed polysilicon being isolated from said regions of lower and higher energy beam reflection characteristics by an isolating layer and wherein said layer of energy beam annealed polysilicon over said regions of lower energy beam reflection characteristics has resistivity suitable for the fabrication of resistors over said interisland areas.

4,560,423

PROCESS FOR PRODUCING A NON-ORIENTED ELECTROMAGNETIC STEEL SHEET HAVING EXCELLENT MAGNETIC PROPERTIES

Yoshiaki Shimoyama; Kunisuke Miyoshi, and Yoshitaka Hiromae, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP81/00202, § 371 Date Mar. 15, 1983, § 102(e) Date Mar. 15, 1983, PCT Pub. No. WO83/00506, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 28, 1981, Ser. No. 486,949

Claims priority, application Japan, Aug. 5, 1981, 56-122731

Int. Cl.⁴ H01F *1/04*

U.S. Cl. 148—111 **6 Claims**

1. A process for producing a non-oriented electromagnetic steel sheet having excellent magnetic properties, wherein a steel slab for producing a non-oriented electromagnetic steel sheet is successively subjected to the steps comprising:

hot-rolling steel consisting essentially of not more than 0.005% carbon, not less than 2.5% silicon, not less than 1.0% aluminum, the total content of silicon and aluminum being from 3.5% to 5.0%, not more than 0.005% sulfur, and not more than 0.0040% nitrogen, the balance being iron;

hot-coil annealing;

single-stage cold-rolling at a final reduction of from 55% to 87% to obtain a thickness of said non-oriented electrical steel sheet; and

finishing annealing, in which a soaking is carried out at a temperature of 1050° C. or more for a period of from 3 to less than 60 seconds, and wherein heating from 400° C. to 800° C. in finishing annealing is carried out at an average rate of temperature elevation of at least 10° C./sec.

4. A process for producing a non-oriented electromagnetic steel sheet having excellent magnetic properties, wherein a steel slab for producing a non-oriented electromagnetic steel sheet is successively subjected to the steps comprising:

hot-rolling steel consisting essentially of not more than 0.005% carbon, not less than 2.5% silicon, not less than 1.0% aluminum, the total content of silicon and aluminum being from 3.5% to 5.0%, not more than 0.005% sulfur, and not more than 0.0040% nitrogen, the balance being iron;

hot-coil annealing;

multi-stage cold-rolling with an intermediate annealing, at a final reduction of from 55% to 87% to obtain a thickness of said non-oriented electrical steel sheet; and

finishing annealing, in which a soaking is carried out at a temperature of 1050° C. or more for a period of from 3 to less than 60 seconds, and wherein heating from 400° C. to 800° C. in finishing annealing is carried out at an average rate of temperature elevation of at least 10° C./sec.

4,560,424

PROCESS FOR FORMING A PRESTRESS ANCHORAGE BY DRAWING A STEEL SLEEVE OVER A METAL CORE

Jean-Pierre Augoyard, Domont, France, assignor to G.T.M.-Entrepose, Nanterre, France

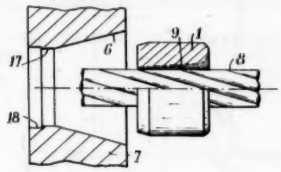
Filed Jul. 3, 1984, Ser. No. 627,357

Claims priority, application France, Jul. 6, 1983, 83 11234

Int. Cl.⁴ C21D *1/10, 1/40, 1/42*

U.S. Cl. 148—150 **4 Claims**

1. A process for forming a prestress anchorage by drawing a steel sleeve over a metal elongate core having a substantially rounded section, consisting in using a sleeve having an inner diameter substantially equal to the outer diameter of the metal core, in forming grooving or indentations in the inner cylindrical surface of the sleeve, in subjecting said inner cylindrical surface of the sleeve and its grooving to a surface heat treatment adapted to increase the hardness thereof and to give



thereto a value greater than that of the metal core, by causing the tempering depth to increase from a first end of the sleeve, intended to be engaged first in a draw-plate, as far as the opposite end of the sleeve and in anchoring the sleeve on the metal core in a way known per se, by drawing through the draw-plate.

4,560,425

$LiClO_4$ CONTAINING PROPELLANT COMPOSITIONS

Donald E. Olander, Valencia, Calif., and Juho Hyyppa, 34110 Lakiala, Tampere City, Finland, assignors to Hi-Shear Corporation, Torrance, Calif., by said Donald E. Olander

Filed Oct. 22, 1982, Ser. No. 436,059

Int. Cl.⁴ C06B *45/10*

U.S. Cl. 149—19.91 **1 Claim**

1. A propellant composition comprising the product obtained by curing an initially liquid or liquified mixture consisting essentially of:

(a) 3 hydroxy propyl methacrylate;

(b) an equal mixture of 1-mononitroglycerine and 2-mononitroglycerine; and

(c) lithium perchlorate, in such proportions that (a) and (b) when mixed assimilates (c), and when cured forms an energetic composition which is ignitable to produce hot gases.

4,560,426

PROCESS FOR THE MANUFACTURE OF IDENTITY CARDS

Roland Moraw, Wiesbaden; Manfred Unger, Schlangenbad, and Helmut Walter, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 7, 1979, Ser. No. 101,183

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853893

Int. Cl.⁴ B32B *31/04*

U.S. Cl. 156—64 **11 Claims**

1. A process for the manufacture of multilayer identify cards, said process comprising the steps of:

providing a core material magazine;

providing a card core material in said magazine;

automatically removing said card core material from the magazine;

feeding said core material into an electrophotographic copying device;

directly transferring identity information from a recording carrier in said copying machine to said card core material forming an image carrier;

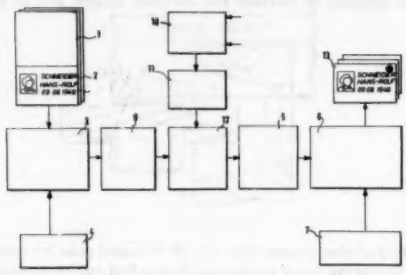
transporting said card core materials to an intermediate magazine and serially storing them therein;

subsequent to said transporting step, moving said card core materials into a laminating press;

supplying said laminating press with transparent protective films;

inserting a relief grid image into the card core as a security marking, said relief grid image having a linear grid structure, the grid depth thereof determining a given image color upon reproduction; and

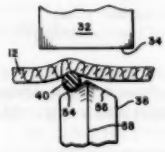
laminating said protective films on each side of said card core material forming identity card blanks.



4,560,427
ULTRASONIC SEAL AND CUT METHOD AND APPARATUS

Gary N. Flood, Oxford, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Dec. 3, 1984, Ser. No. 677,605
Int. Cl.[4] B29C *27/08*; B32B *31/18*
U.S. Cl. 156—73.3 **20 Claims**



1. The method of providing a finished edge on sheet material utilizing an ultrasonic seal and cut apparatus including the steps of:

providing an ultrasonic seal and cut station comprising an anvil and an opposing horn adapted to be resonant at an ultrasonic frequency;

passing sheet material through said station for causing material disposed between said anvil and said horn to be cut and simultaneously sealed in a marginal area adjacent said cut in response to said horn being resonant and in contact with the sheet material passing over said anvil;

feeding at least one thread adapted to melt responsive to the dissipation of ultrasonic energy provided by said horn simultaneously with the sheet material between said anvil and said horn in a position for causing said thread to melt and become fused with the sheet material in said marginal area, and

removing the cut and sealed portion of the sheet material from the seal and cut station.

15. An ultrasonic seal and cut apparatus for sheet material including a seal and cut station in the form of an anvil and an opposing horn adapted to be resonant at an ultrasonic frequency for providing ultrasonic energy to the sheet material fed over said anvil, the improvement comprising:

means for feeding sheet material through said station;

said anvil having a cutting surface and an adjacent sealing surface;

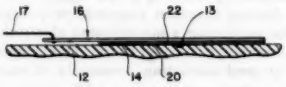
means for feeding a thread, adapted to melt responsive to the dissipation of ultrasonic energy provided by said horn, simultaneously with the sheet material between said anvil and said horn for being exposed to said sealing surface,

whereby to cause said cutting surface to cut the sheet material responsive to said horn being resonant and in contact with the sheet material and said thread to melt and become fused with the sheet material in a marginal area adjacent the cut responsive to the exposure of said marginal area to said sealing surface.

4,560,428
SYSTEM AND METHOD FOR PRODUCING CURED COMPOSITES

George O. Sherrick, and Joseph R. Rosenthal, both of Tulsa, Okla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 20, 1984, Ser. No. 642,010
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—94 **37 Claims**



23. A process for repairing a damaged structural component which comprises,

placing a patch on the surface of said structural component, said patch including an electric resistance heating element in the form of a layer of graphite fibers,

incorporating an adhesive film of a heat curable thermosetting resin between said patch and said structural component,

passing an electric current through said resistance heating element and heating said heat curable thermosetting resin to a predetermined temperature, thereby causing said patch and said heating element to be integrally bonded to said structural component to form a composite.

4,560,429
PROCESS FOR PREPARING MOISTURE-RESISTANT PACKING CARDBOARD

Lino Credali, Casalecchio di Reno; Paolo Parrini, Ferrara; Mario Milano, Ferrara, and Domenico Lori, Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 903,949, May 8, 1978, abandoned. This application Aug. 14, 1979, Ser. No. 66,328
Claims priority, application Italy, May 9, 1977, 23339 A/77
Int. Cl.[4] B31F *1/20*
U.S. Cl. 156—208 **2 Claims**

1. A process for the preparation of mono- or multi-wave corrugated cardboard which consists of the following operations:

(1) preparation of flat paper sheets containing from 20% to 80% by weight of cellulose fibers and from 80% to 20% by weight of synthetic thermoplastic polymer fibrils having a specific surface area greater than 1 sq.mt/gram;

(2) heating said paper sheets, under pressure, and at a temperature equal to or higher than the melt temperature of the thermoplastic synthetic polymer forming said fibrils, or higher than the melt temperature of the polymer having the lowest melt temperature among those of the polymers forming said fibrils;

(3) preparation of corrugated paper sheets starting from flat paper sheets obtained according to operations (1) or (2), by heating said flat paper sheets under pressure, on an undulated surface, at a temperature equal to or higher than the melt temperature of the synthetic thermoplastic poly-

mer contained in said sheets, or higher than the melt temperature of the thermoplastic polymer having the lowest melt temperature among the synthetic thermoplastic polymers contained in said sheets; and

(4) coupling the flat sheets obtained according to operation (2) to the corrugated sheets of paper, alternately the one to the other, with simultaneous mutual welding at the tips of the undulations, by binders or by melting of the synthetic thermoplastic polymer present in the sheets at the tips of the undulations.

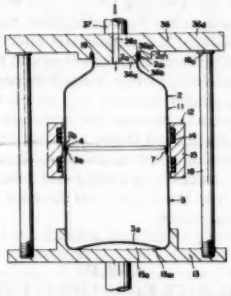
4,560,430
METHOD OF MAKING A METALLIC CONTAINER

Michio Watanabe, Yokohama; Kazuhisa Ishibashi, Tokyo; Hisakazu Yasumuro, Yokohama; Hideo Kurashima, and Tsuneo Imatani, both of Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,223

Int. Cl.⁴ B29C *17/00, 19/06;* **B65C** *3/26;* **C09J** *5/00*

U.S. Cl. 156—285 **13 Claims**



1. A method of making a metallic container having a circuferential seam, said circumferential seam being formed by fitting a first open end portion of an upper can body having a venting portion and a second open end portion of a lower can body having a bottom portion to each other with a heat sealable layer therebetween to form a metallic container preform having a fitted portion, said first and second end portions extending axially and straightly, and heating the fitted portion thereby to fuse said adhesive layer, which comprises placing said container preform between a first member and a second member which are oppositely disposed with a predetermined distance therebetween, such that said venting portion faces said first member and said bottom portion faces said second member, heating said fitted portion, while simultaneously enhancing through a gaseous medium an internal pressure generated in said container prefrom, thus causing an axial outward slip between said first and second open end portions through said fused adhesive layer by the elevated internal pressure, until said container preform has a predetermined height, and then suppressing any further axial outward slip by said first and second members when said container preform has reached said predetermined height, thereby to form said container having said predetermined height.

4,560,431
DEVICE FOR GLUING SHEET-LIKE TEXTILE ARTICLES

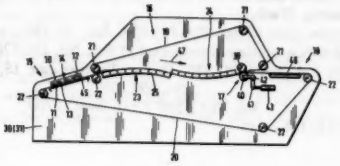
Jürgen Inselmann, Löhne, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,477

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303504

Int. Cl.⁴ B30B *5/06, 15/34*

U.S. Cl. 156—359 **19 Claims**



1. A device for gluing sheet-like textile articles comprising, two conveyor belts which are driven continuously and at the same speed, said conveyor belts overlaying each other in a transport region, with textile articles to be joined together being conveyable between the overlaying belts in the transport region, a heating station having several heating zones, and a pressing station located downstream of the heating zones in the conveying direction, the pressing station and individual heating zones being arranged in succession in the transport plane of the conveyor belts, each heating zone having a heatable plate (**23, 24**), wherein each of the heatable plates (**23, 24**) consists of several hollow-profile heaters (**25**) arranged next to one another, and wherein each hollow-profile heater includes an electrically heatable panel heater (**26**) attached to the rear side of a top wall (**28**) of its respective hollow-profile heater said device for gluing further including means for selectively supplying electricity to said panel heaters (**26**) either individually or in groups.

4,560,432
APPARATUS FOR PRODUCING LABELS

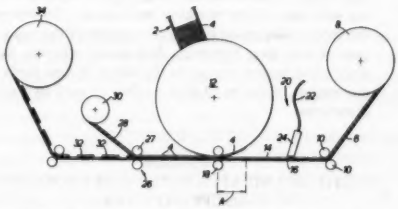
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, England

Division of Ser. No. 506,807, Jun. 22, 1983, Pat. No. 4,488,922. This application Oct. 3, 1984, Ser. No. 657,167

Claims priority, application United Kingdom, Jun. 25, 1982, 8218496

Int. Cl.⁴ B31F *1/00;* **B32B** *31/00*

U.S. Cl. 156—459 **9 Claims**



1. Apparatus for producing a succession of lithographically-printed self-adhesive labels on a length of release backing material, which apparatus comprises means for transferring individual lithographically-printed sheets in succession from a stack of such sheets to a support web, the support web comprising a self-adhesive backed material carried on a release backing material, means for adhering the lithographically-

printed sheets to the support web, a cutting device for cutting the adhered lithographic sheets and the self-adhesive backed material to form the required labels on the length of release backing material, and means for removing the unwanted portions of the printed sheets and adhesive-backed material adhered thereto.

4,560,433

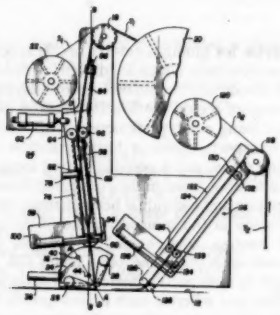
BI-DIRECTIONAL APPLICATOR HEAD WITH DUAL TAPE SUPPLY

Ed Frank, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 457,853, Jan. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 192,570, Sep. 30, 1980, Pat. No. 4,382,836. This application Jan. 15, 1985, Ser. No. 691,379

Int. Cl.⁴ B31F *1/00*; B44C *7/00*

U.S. Cl. 156—459 **6 Claims**



1. A tape applicator head for applying two different types of fiber impregnated tape in two opposing directions onto a working surface, the different types of tape being distinguished by the orientation of the fibers, comprising:

separate supply means for supplying each type of tape;

mounting means;

first dispensing means, mounted to the mounting means adjacent the working surface, which includes two spaced dispensing blocks between which one of said tapes passes and which alternately engage the tape during movement of the head in the two opposing directions, for imparting a tension to the tape to draw the tape past the dispensing blocks onto the working surface, and compacting the tape so dispensed in each direction; and

second dispensing means, mounted to the mounting means adjacent the working surface, which includes means for imparting a tension to the other of said tapes and advancing said tape to the working surface, and for compacting the tape so dispensed during movement of the head in only one of said two opposing directions, wherein said first dispensing means compacts the other of said tapes during movement of the head in the other of said two opposing directions.

4,560,434

METHOD AND APPARATUS FOR PRODUCING BOUFFANT CAPS

Takeshi Sato, Azuchi, Japan, assignor to Nankaisangyo Co. Ltd. and Toyamasanki Co. Ltd., both of, Japan

Filed Dec. 27, 1983, Ser. No. 565,577

Int. Cl.⁴ B31F *1/34*; B32B *31/00*; D05B *35/08*; A42B *1/12*

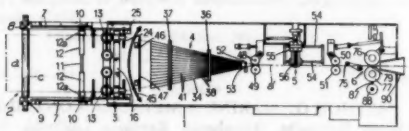
U.S. Cl. 156—474 **13 Claims**

1. Apparatus for producing bouffant caps and the like, comprising:

a longitudinally extending frame for mounting the apparatus components along a straight line of travel, said frame having a forward end and a rearward end;

a support and supply section mounted at said frame rearward end comprising means for deliverably supporting a band-like material wound in roll form; and means for automatically delivering the material at a constant speed and in a generally horizontal orientation, the material thus having an upper and a lower side;

a stretchable linear element laying section mounted on said frame forward of said support and supply section and comprising two bobbin means each for containing a supply of a stretchable linear element and means for continuously laying the linear elements on and along opposite lateral edges of the material being delivered, and tension adjusting means disposed below said bobbin means for adjusting the tension of the linear element;



a welding section mounted on said frame forward of said element laying section comprising means for integrally welding the laid linear elements to the material;

a zigzag folding section mounted on said frame forward of said welding section, said zigzag folding section comprising means for supplying the material with welded linear elements, and means for continuously zigzag folding said supplied material in the transverse direction;

a fixed length seal section mounted on said frame forward of said zigzag folding section comprising means for bunching the zigzag folded material, and means for welding the bunched material between the stretchable linear elements on both sides at fixed length intervals; and

a cutter section mounted on said frame forward of said seal section for successively cutting said material substantially transversely to the longitubinal direction at the middle of each welded region.

4,560,435

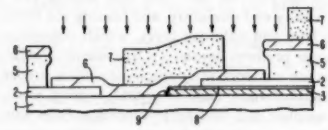
COMPOSITE BACK-ETCH/LIFT-OFF STENCIL FOR PROXIMITY EFFECT MINIMIZATION

Karen H. Brown, Yorktown Heights, N.Y.; David F. Moore, Cambridge, England, and Bernard J. C. van der Hoeven, Jr., Pound Ridge, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,803

Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **2 Claims**



1. A method for making integrated circuits having critical wafer areas which are susceptible to proximity effect degradation at critical areas —characterized by—

(a) patterning a lift-off resist stencil factor with windows including contact dimensions and extension dimensions extending beyond the contact dimensions in the critical areas with respect to proximity effects;

(b) depositing contact metal using the windows as a pattern,

covering both contact dimensions and extension dimensions;

(c) patterning a back-etch resist stencil factor over selected portions of said contact metal, providing protection to the underlying layers within the contact dimensions but exposing contact metal within the extension dimensions;

(d) back etching to the selected pattern of metallization by removing contact metal from the extension dimensions; and

(e) removing said lift-off resist stencil factor and said back-etch resist stencil factor.

4,560,436

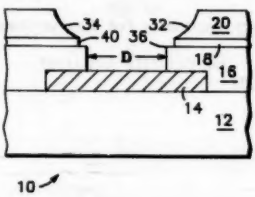
PROCESS FOR ETCHING TAPERED POLYIMIDE VIAS

Yefim Bukhman, Tempe, and Steven C. Thornquist, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,263

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*

U.S. Cl. 156—643 **2 Claims**



1. A method for forming an opening through a polyimide layer to expose an underlying surface wherein the dimension of the opening exposing the underlying surface is controlled and is characterized by tapered sidewalls, comprising the steps of forming a first layer of cured polyimide on the underlying surface; forming a thin layer of oxide over said first layer of cured polyimide; forming a second layer of polyimide over said thin layer of oxide; forming a second layer of oxide over said second layer of polyimide; forming a masking layer over said second layer of oxide; selectively patterning said masking layer thereby forming at least one opening therethrough to expose a portion of said second layer of oxide wherein said at least one opening being of predetermined size; anisotropically etching said second layer of oxide exposed through said masking layer to expose a portion of said second layer of cured polyimide underlying said at least one opening; isotropically etching said second layer of cured polyimide using said second layer of oxide as an etch mask to form an opening exposing a portion of said first layer of oxide wherein said opening through said second layer of cured polyimide having tapered sidewalls and said exposed portion of said first layer of oxide being an opening of substantially the same dimensions as said at least one opening, said first layer of oxide acting as an etch stop; anisotropically etching said first layer of oxide using said second layer of oxide as an etch mask to expose an opening to said first layer of cured polyimide; anisotropically etching said first layer of cured polyimide using said second layer of oxide as an etch mask to form an opening of said predetermined size on the underlying surface.

4,560,437

PROCESS FOR DELIGNIFICATION OF CHEMICAL WOOD PULP USING SODIUM SULPHITE OR BISULPHITE PRIOR TO OXYGEN-ALKALI TREATMENT

Peder J. Kleppe, and Sverre Storebraten, both of Moss, Norway, assignors to M. Peterson & Son A/S, Moss, Norway

Filed Jun. 22, 1984, Ser. No. 623,248

Claims priority, application Norway, Jun. 29, 1983, 832370

Int. Cl.⁴ D21C *3/04, 3/12, 3/20, 3/26*

U.S. Cl. 162—65 **2 Claims**

1. In a process for delignification of chemical wood sulfate or polysulfide pulp having a Kappa number of at least 30 by oxygen-alkali treatment, the step of treating the chemical wood pulp with a solution of either sodium sulfite or sodium bisulfite in an amount effective to enhance Kappa number reduction without increasing the amount of oxygen and alkali used during the oxygen-alkali treatment, prior to oxygen alkali treatment.

4,560,438

METHOD AND APPARATUS FOR REDUCING THE ENERGY CONSUMED WHEN DRYING A PAPER WEB

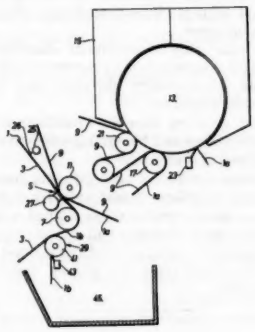
Lars E. K. A. Tell, Karlstad, and Carl C. E. Johannesson, Forshaga, both of Sweden, assignors to KMW Aktiebolag, Karlstad, Sweden

Filed May 31, 1984, Ser. No. 615,997

Claims priority, application Sweden, Jun. 1, 1983, 8303075

Int. Cl.⁴ D21F *11/00*

U.S. Cl. 162—194 **6 Claims**



1. A method for reducing the amount of energy consumed in the drying section of a paper machine in which a paper web is formed on a moving fabric and is thereafter picked up and transferred from the fabric and conveyed to and through a drying section, said method comprising

trimming the formed web which the web is being conveyed on the fabric so as to divide the web into a trimmed web and couch trimmings extended along each edge thereof,

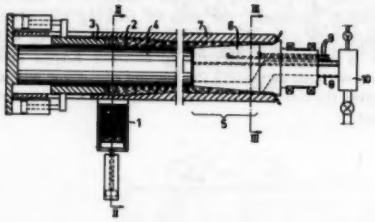
applying suction to the fabric on the reverse side of the fabric from the web in preselected areas where the couch trimmings lie so as to displace the portions of the fabric upon which the couch trimmings lie and to retain the couch trimmings by suction on the fabric and while transferring only the trimmed paper web from the fabric to the drying section, and

separating the retained couch trimmings from the surface of the fabric.

4,560,439
METHOD AND GRINDER FOR THE MANUFACTURE OF PULP

Ernst G. Ranhagen, Meteorvägen 60, Täby, Sweden

PCT No. PCT/SE81/00391, § 371 Date Aug. 13, 1982, § 102(e) Date Aug. 13, 1982, PCT Pub. No. WO82/02219, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 22, 1981, Ser. No. 413,370
Claims priority, application Sweden, Dec. 23, 1980, 8009096
Int. Cl.⁴ D21B 1//14
U.S. Cl. 162—261 2 Claims



1. Apparatus for grinding lignocellulosic pulp material in chip form, comprising:

(a) a hollow cylinder defining a grinding zone in one end thereof and a feeding zone in the other end thereof, in which the pulp material is advanced into said grinding zone;

(b) a stationary core extending axially through said feeding zone and defining a tubular chip-advancement chamber between the exterior surface of said core and the interior surface of said cylinder;

(c) means for feeding the pulp material into said tubular chip-advancement chamber;

(d) means within said cylinder for advancing said pulp material in said tubular chip-advancement chamber towards said grinding zone;

(e) said tubular chip-advancement chamber converging towards said grinding zone to compress said pulp material during its advancement through said tubular chip-advancement chamber;

(f) a rotating grinding member extending axially through said grinding zone and being aligned with and facing the opposing end of said core;

(g) the exterior surface of said grinding member and the facing interior surface of said cylinder defining therebetween an annular grinding space aligned with said tubular chip-advancement chamber and converging outwardly to form a narrowed outlet gap for the ground material; and

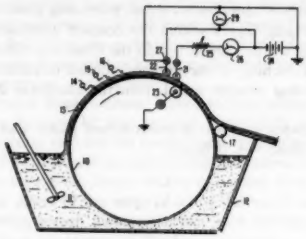
(h) means for discharging the ground material from said grinding zone.

4,560,440
APPARATUS FOR MEASURING CONCENTRATION OF DISSOLVED SOLIDS IN A PULP MAT

Edward P. Klein, and Thomas M. Neider, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 583,988, Feb. 27, 1984. This application Aug. 20, 1984, Ser. No. 642,489
Int. Cl.⁴ D21C 9/06; D21F 7/06
U.S. Cl. 162—263 2 Claims

1. An apparatus for monitoring the effectiveness of washing apparatus to remove solids dissolved in aqueous liquor from the presence of digested paper pulp carried as a fibrous mat on the surface of a traveling filter screen, said mat having a top surface and a bottom surface, said apparatus comprising electrical contact means for providing electrical contact with said mat top surface, ground means for electrically grounding said filter screen, electric power supply means to energize said contact means, circuit means to measure electric resistance between said mat top surface and said filter screen, mat thickness measurement means to measure the linear separation distance between said mat top surface and said bottom surface

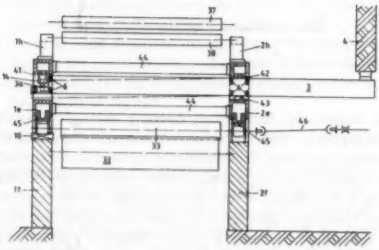


and means for relating the measured electrical resistance and distance to the concentration of dissolved solids in said aqueous liquor.

4,560,441
PRESS SECTION FOR A PAPER-MAKING MACHINE HAVING A MOVABLE CANTILEVER BEAM

Wilfred Kraft, and Wilhelm Benz, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 386,645, Jun. 9, 1982, abandoned, which is a continuation of Ser. No. 200,477, Oct. 24, 1980, abandoned. This application Oct. 20, 1982, Ser. No. 435,484
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2943974
Int. Cl.⁴ D21F 3/02, 3/04
U.S. Cl. 162—273 24 Claims



1. A press section for a paper-making machine, wherein the press section includes press rollers for squeezing a felt, and felt guiding rollers for leading the felt over a pathway and past the press rollers;

a base of the machine for supporting the press section;

an operating side frame component located toward one of the ends of the press rollers; a power side frame component located toward the other of the ends of the press rollers and spaced from the operating side frame component;

a cantilever beam extending from the operating side frame component to the power side frame component and beyond the power side frame component to a support area;

a structural part connected to the base of the machine and located in the support area; the cantilever beam extending to the structural part, for defining three points of contact along the length of the cantilever beam, at the structural part, at the power side frame component and at the operating side frame component; the cantilever beam meeting both the operating side frame component and the power

side frame component at respective points of contact, the cantilever beam being movable relative to each of the frame components at the respective point of contact;

an intermediate piece removably disposed between the operating side frame component and the base of the machine for supporting the operating side frame component, and the operating side frame component rests on the intermediate piece;

force applying means for applying force to the cantilever beam for tensioning the cantilever beam for lifting the operating side frame component off the intermediate piece, which permits removal of the intermediate piece; and

an additional transverse beam spaced away from the cantilever beam for connecting the operating side frame component and the power side frame component.

4,560,442

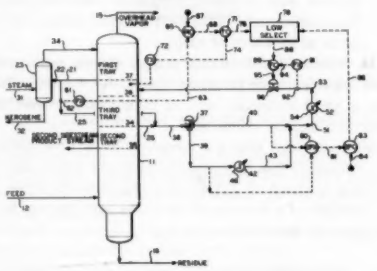
FRACTIONAL DISTILLATION PROCESS CONTROL

Gyan P. Jain, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 15, 1984, Ser. No. 589,915

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—2 **8 Claims**



1. Apparatus comprising:

a fractional distillation column;

means for providing a feed stream to said fractional distillation column, wherein components contained in said feed stream are at least partially separated in said fractional distillation column;

means for withdrawing a first sidedraw product feed stream from a first tray of said fractional distillation column;

means for withdrawing a second sidedraw product feed stream from a second tray of said fractional distillation column;

means for withdrawing a pump-around stream from a third tray of said fractional distillation column, wherein said first tray is above said second tray and said third tray is between said first tray and said second tray;

a first heat exchanger;

means for providing a cooling fluid to said first heat exchanger;

means for passing said pump-around stream through said first heat exchanger and for returning the cooled pump-around stream to said fractional distillation column at a point between said first tray and said third tray as a side external reflux stream;

means for establishing a first signal representative of the actual flow rate of fluid at said first tray which is not a part of said first sidedraw product feed stream;

means for establishing a second signal representative of the flow rate of fluid at said first tray, which is not a part of said first sidedraw product feed stream, required to maintain a desired separation between a first sidedraw product stream produced from said first sidedraw product feed stream and a second sidedraw product stream produced from said second sidedraw product feed stream;

means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the temperature in said fractional distillation column in the area of said first tray required to maintain a desired separation between said first sidedraw product stream and said second sidedraw product stream;

means for establishing a fourth signal representative of the actual temperature in said fractional distillation column in the area of said first tray;

means for comparing said third signal and said fourth signal and for establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal, wherein said fifth signal is scaled so as to be representative of the flow rate of said side external reflux stream required to maintain the desired temperature represented by said third signal; and

means for manipulating the flow rate of said side external reflux stream in response to said fifth signal to thereby maintain the actual flow rate of said side external reflux stream substantially equal to the desired flow rate represented by said fifth signal.

5. A method for maintaining a desired separation between a first sidedraw product stream produced from a first sidedraw product feed stream withdrawn from a first tray of a fractional distillation column and a second sidedraw product stream produced from a second sidedraw product feed stream withdrawn from a second tray of said fractional distillation column, wherein a feed stream provided to said fractional distillation column is at least partially separated in said fractional distillation column to produce said first sidedraw product feed stream and said second sidedraw product feed stream, wherein a pump-around stream is withdrawn from a third tray of said fractional distillation column, cooled and then returned to said fractional distillation column at a point between said first tray and said third tray as a side external reflux stream and wherein said first tray is above said second tray and said third tray is between said first tray and said second tray, said method comprising the steps of:

establishing a first signal representative of the actual flow rate of fluid at said first tray which is not a part of said first sidedraw product feed stream;

establishing a second signal representative of the flow rate of fluid at said first tray, which is not a part of said first sidedraw product feed stream, required to maintain a desired separation between said first sidedraw product stream and said second sidedraw product stream;

comparing said first signal and said second signal and establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the temperature in said fractional distillation column in the area of said first tray required to maintain a desired separation between said first sidedraw product stream and said second sidedraw product stream;

establishing a fourth signal representative of the actual temperature in said fractional distillation column in the area of said first tray;

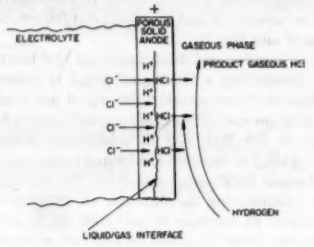
comparing said third signal and said fourth signal and establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal, wherein said fifth signal is scaled so as to be representative of the flow rate of said side external reflux stream required to maintain the desired temperature represented by said third signal; and

manipulating the flow rate of said side external reflux stream in response to said fifth signal to thereby maintain the actual flow rate of said side external reflux stream substantially equal to the desired flow rate represented by said fifth signal.

4,560,443
GAS DIFFUSION ANODE

Peter C. Foller, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 499,135, May 31, 1983, Pat. No. 4,477,322.
This application Dec. 5, 1983, Ser. No. 557,810
Int. Cl.[4] C25B *11/03, 11/06, 11/08, 11/12*
U.S. Cl. 204—283 **3 Claims**



1. A gas diffusion anode comprising an electrically-conductive composite comprising:

(a) amine-functionalized carbon;

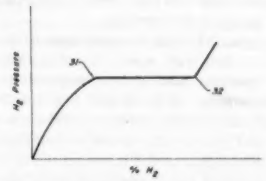
(b) a noble metal catalyst which catalyzes the production of hydrogen ions from hydrogen; and

(c) a polymeric material, said composite being held together by said polymeric material.

4,560,444
GAS DETECTION WITH NOVEL ELECTROLYTE MEMBRANE AND SOLID INTERNAL REFERENCE

Anthony J. Polak, Lake Zurich, and Allyson J. Beuhler, Indian Head Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1983, Ser. No. 566,845
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—1 T **19 Claims**



1. An apparatus for detection, in a gas sample, of a gaseous component, which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions or of combining with hydrogen ions, which apparatus comprises:

(a) a thin film organic-inorganic membrane which comprises a blend of: (1) from about 10% to about 70% by weight of a heteropoly acid and salts thereof having the generic formula:

$$A_m[X_xY_yO_z].nH_2O$$

in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third and fourth transitional metal series of the Periodic Table and where Y is dissimilar from X and is selected from at least one metal of the first, second, third and fourth transitional metal series of the Periodic Table, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, m is an integer of from about 1 to 10, y is a integer of from 6 to 12 based on x being equal to 1, z is an integer of from 30 to 80 and n is an integer of from 3 to 100 and, (2) from about 90% to about 30% by weight of a polymer compatible with said compound selected from the group consisting of poly (vinyl alcohol), poly (vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethylethyl ether and phenol formaldehyde resins;

(b) an organic-inorganic membrane housing comprising a sample gas chamber and a reference chamber separated by a substantially imporous partition comprising said organic-inorganic membrane, said membrane having a first surface in common with the sample gas chamber and a second surface in common with the reference chamber;

(c) two separate portions of catalytic agent effective to promote dissociation and combination, a first portion in contact with said first surface and a second portion in contact with said second surface of said membrane;

(d) a reference substance in said reference chamber and in contact with said second catalytic agent portion, which substance exhibits a substantially constant known hydrogen partial pressure during use of said detection apparatus; and,

(e) means for forming electrical connection in operative contact with said first portion of catalytic agent at said first surface and with said second portion of catalytic agent at said second surface.

14. A method of detecting, in a gas sample, a gaseous component capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions or of combining with hydrogen ions, said method comprises:

(a) contacting said gas sample with a first surface of an imporous thin film organic-inorganic membrane comprising a blend of: (1) from about 10% to about 70% by weight of a heteropoly acid and salts thereof having the generic formula:

$$A_m[X_xY_yO_z].nH_2O$$

in which X is selected from the group consisting of boron, aluminum, gallium, silicon, germanium, tin, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, iodine, and metals of the first, second, third and fourth transitional metal series of the Periodic Table and where Y is dissimilar from X and is selected from at least one metal of the first, second, third and fourth transitional metal series of the Periodic Table, A is selected from the group consisting of hydrogen, ammonium, sodium, potassium, lithium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium, m is an integer of from about 1 to 10, y is an integer of from 6 to 12 based on x being equal to 1, z is an integer of from 30 to 80 and n is an integer of from 3 to 100 and, (2) from about 90% to about 30% by weight of a polymer compatible with said compound selected from the group consisting of poly (vinyl alcohol), poly (vinyl fluoride), polyethylene oxide, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, polyvinylmethyethyl ether and phenol formaldehyde resins having a first portion of catalytic agent in contact therewith effective to promote dissociation and combination;

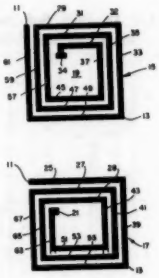
(b) contacting a reference substance which exhibits a substantially constant known hydrogen partial pressure, with a second surface of said organic-inorganic membrane of step (a) having a second portion of catalyst in contact therewith; and,

(c) detecting EMF between means for forming electrical connection in operative contact with said first portion of catalytic agent at said first surface and with said second portion of catalytic agent at said second surface of said membrane.

4,560,445
CONTINUOUS PROCESS FOR FABRICATING METALLIC PATTERNS ON A THIN FILM SUBSTRATE

Merwin F. Hoover, Topsfield, Mass.; Phillip B. Reilly, Mountain Lakes, N.J.; Ann B. Salamone, Marblehead, and Jan Vandebult, Topsfield, both of Mass., assignors to Polyonics Corporation, Newbury Port, Mass.

Filed Dec. 24, 1984, Ser. No. 685,345
Int. Cl.[4] C25D *5/02, 5/56*
U.S. Cl. 204—15 26 Claims



1. A process for forming a conductive circuit on a thin polyolefin film substrate which comprises passing said polyolefin film sequentially through:

(a) a liquid plasticizing bath adapted to effect plasticizing or softening of said film,

(b) a liquid etching bath adapted to provide attraction sites for subsequent catalytic metal deposition and to produce microvoids for increased adhesion for a subsequently applied metal layer,

(c) a liquid conditioning bath adapted to improve adsorption of the subsequently applied metal catalyst,

(d) a liquid catalyst bath to effect deposition of a catalytic metal layer on said substrate,

(e) a printing step to print a negative image of the circuit on the film surface,

(f) a liquid accelerator bath, to convert the catalytic metal layer to an active state to effect subsequent electroless plating of metal,

(g) an electroless metal deposition bath, thereby to electrolessly deposit metal on the non-printed portion of said film, and

(h) at least one electrolytic plating cell in order to increase the metal thickness to the desired level for optimum functionality of the finished circuit;

said steps (a), (b), (c), (d), (e), (f), (g), and (h) being conducted so as to retain mechanical integrity of said substrate.

4,560,446
METHOD OF ELECTROPLATING, ELECTROPLATED COATING AND USE OF THE COATING

Thinh Nguyen, Onex; Jean-Pol Wisux, Croix-de-Rozon, and Christopher J. Vance, Chêne-Bougeries, all of Switzerland, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Dec. 18, 1984, Ser. No. 683,006
Claims priority, application European Pat. Off., Dec. 23, 1983, 83810617.7
Int. Cl.[4] C25D *3/44*
U.S. Cl. 204—58.5 26 Claims

1. A method of electroplating an alloy of one or more transition metals of groups IVB, VB or VIB of the periodic table with aluminum at near ambient temperature onto an electrically conductive substrate in a non-aqueous electrolyte, characterized by the electroplating being carried out in an electrolyte comprising an aromatic hydrocarbon and an aluminum halide, wherein said transition metal(s) has (have) been dissolved in a high oxidation halide state and then pre-reduced to a lower oxidation state.

4,560,447
ELECTROLYTIC PROCESS FOR PREPARATION OF α-ALKYLATED ACETIC ACID DERIVATIVES

Tatsuya Shono, Kyoto, Japan, assignor to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19. 1984, Ser. No. 672,731
Claims priority, application Japan, Nov. 18, 1983, 58-218369
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—59 R 11 Claims

1. A process for preparing an α-alkylated acetic acid derivative represented by the formula

$$Y-\underset{\displaystyle R'}{\overset{\displaystyle |}{CH}}-Z \qquad (II)$$

wherein Z is —COOR or —CN in which R is straight-chain or branched-chain alkyl, cycloalkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted aralkyl, R' is substituted or unsubstituted straight-chain or branched-chain alkyl or alkenyl, and Y is an optionally substituted heterocyclic group or optionally substituted aromatic group, the substituents for the groups represented by Y being at least one species selected from the group consisting of hydroxyl, alkoxy, halogen, nitro, alkyl, alkenyl, alkylthio, alkenylthio, arylthio, heterocyclic thio group, cyclic tertiary amino, dialkylamino, alkenyloxy, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy and substituted or unsubstituted aralkyloxy, the aromatic group or heterocyclic group, when having two or more adjacent substituents, optionally constituting a substituted or unsubstituted fused ring which may contain sulfur, oxygen and/or nitrogen, the process comprising electrolyzing an electrolysis medium consisting essentially of:

(a) a compound of the formula

$$Y-CH_2-Z \qquad (I)$$

wherein Y and Z are as defined above,

(b) an alkylating agent,

(c) a solvent, and

(d) a supporting electrolyte,

thereby effecting electrolytic reduction of the compound of the formula (I) and alkylation of the resulting electrolytic reduction product to produce said α-alkylated acetic acid derivative of formula (II).

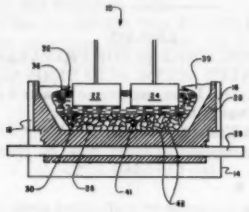
4,560,448
ALUMINUM WETTABLE MATERIALS FOR ALUMINUM PRODUCTION

Ajit Y. Sane, Willoughby; Douglas J. Wheeler, Cleveland Heights, both of Ohio, and Charles S. Kuivila, Evanston, Ill., assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 376,629, May 10, 1982, abandoned. This application Jun. 17, 1983, Ser. No. 505,363
Int. Cl.[4] C25C *3/06, 3/08, 7/00;* B05D *3/00*
U.S. Cl. 204—67 26 Claims

1. In an electrolytic process for electrowinning aluminum from aluminum oxide in solution in a molten cryolite electrolyte floating on a pool of molten aluminum, the improvement which comprises providing therein in contact with said molten aluminum at least one structural or functional component which is formed from a normally aluminum non-wettable refractory material chosen from the group consisting of alumina, aluminum nitride, AlON, SiAlON, boron nitride, silicon nitride, silicon carbides, aluminum borides, alkaline earth metal zirconates and aluminates and their mixtures and having deposited on the surface thereof a thin coating containing both a metallic element wettable by aluminum and chosen from the

group consisting of titanium, zirconium and hafnium and, as a solubility suppressor for said metallic element, boron, and



separately providing in said molten aluminum pool nearly saturating concentrations of said metallic element and boron.

4,560,449

METAL PRODUCTION BY ELECTROLYSIS OF A MOLTEN ELECTROLYTE

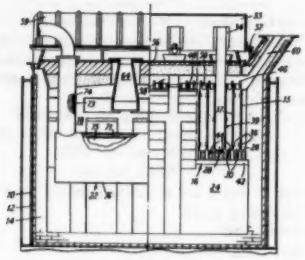
Olivo G. Sivilotti, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Division of Ser. No. 498,848, May 27, 1983, Pat. No. 4,518,475. This application Feb. 21, 1985, Ser. No. 703,733

Claims priority, application United Kingdom, Jun. 14, 1982, 8217165

Int. Cl.[4] C25C *3/00, 3/02, 3/04*

U.S. Cl. 204—70 **3 Claims**



1. A process for the production of a metal by electrolysis of a molten metal chloride electrolyte which is more dense than the metal which process comprises circulating the electrolyte between an electrolysis zone and a metal collection zone,

in the electrolysis zone, introducing electrolyte from the metal collection zone into the lower ends of substantially vertical regions between the electrodes of one or more electrode assemblies each comprising an anode, a cathode and one or more intermediate bipolar electrodes,

passing an electrical current between the anode and the cathode whereby chlorine is generated at anodic electrode faces, the metal is generated at cathodic electrode faces, and an electrolyte/metal/chlorine mixture is caused to rise up the interelectrode regions,

transporting the electrolyte/metal mixture which emerges from the upper ends of the interelectrode regions by means of open-top channels extending longitudinally of the electrodes over a weir adjacent one end of the assembly and thence to the metal collection zone, said transported mixture being maintained substantially undisturbed by chlorine rising from the interelectrode regions,

and maintaining the liquid level substantially constant at a value to control the flow of electrolyte/metal mixture along the channels, and over the weir at a rate slow enough, and without excessive turbulence, to effect substantially complete removal of chlorine but fast enough to maintain molten metal droplets entrained in the electrolyte.

4,560,450

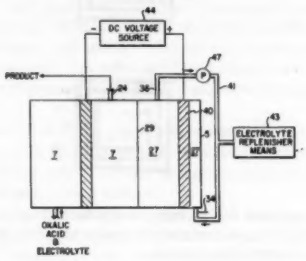
MEANS AND METHOD FOR REDUCING OXALIC ACID TO A PRODUCT

Abraham Morduchowitz, Monsey, N.Y., and Anthony F. Sammells, Naperville, Ill., assignors to Texaco, Inc., White Plains, N.Y.

Filed Apr. 18, 1985, Ser. No. 724,707

Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—75 **12 Claims**



1. A method for reducing carbon dioxide to a product comprising the steps of:

separating a catholyte and an anolyte, in a manner so that electrons can pass between them,

mixing oxalic acid with an electrolyte to provide the catholyte,

passing the catholyte through a porous cathode having a catalyst,

passing the anolyte through a porous anode, and

providing a d.c. voltage across the cathode and the anode so as to cooperate in the reduction of the oxalic acid within the cathode to a product in the catholyte.

4,560,451

ELECTROLYTIC PROCESS FOR THE PRODUCTION OF ALKENE OXIDES

Kenneth A. Nielsen, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 2, 1983, Ser. No. 490,963

Int. Cl.[4] C25B *3/02*

U.S. Cl. 204—79 **16 Claims**

1. An improved epoxidation process for alkenes in an electrolytic cell having a cathode and an anode, which process comprises employing an aqueous solution containing a soluble bromide as an electrolyte, adding to the bromide electrolyte from about 0.01 to 0.5 molar concentration of a catalyst to reduce the formation of dibromoalkene where said catalyst is a carboxylic-group and/or a carboxylate-group containing material prior to impressing a voltage between the cathode and the anode, which voltage induces flow through the electrolyte, and adding to the electrolyte, either before, during or after inducing said current flow, an alkene while providing a temperature and pressure sufficient to maintain the electrolyte in liquid phase and not decompose the carboxylic-group and/or carboxylate-group containing material while epoxidation occurs.

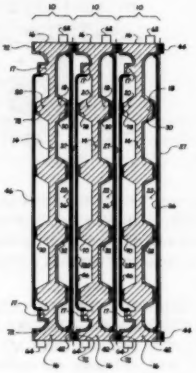
4,560,452
UNITARY CENTRAL CELL ELEMENT FOR DEPOLARIZED, FILTER PRESS ELECTROLYSIS CELLS AND PROCESS USING SAID ELEMENT

Gregory J. E. Morris, Lake Jackson; Sandor Grosshandler, Houston; Richard N. Beaver, Angleton; John R. Pimlott, Sweeny, and Hiep D. Dang, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 472,792, Mar. 7, 1983, Pat. No. 4,488,946. This application Dec. 17, 1984, Ser. No. 682,736

Int. Cl.[4] C25B *1/46, 11/03, 9/00, 13/00*

U.S. Cl. 204—98 **49 Claims**



1. In a cell structure used in forming a bipolar, depolarized electrode, filter press electrolytic cell unit, which unit is capable of being combined with other cell units to form a cell series;

wherein in said series the cell structure is separated from adjacent cell structures by ion-exchange permselective membranes which are sealably disposed between each of the cell structures so as to form a plurality of electrolysis cells;

each of said electrolysis cells having at least one planarly disposed membrane separating each cell into two electrode compartments, an anode compartment and a cathode oompartment;

wherein at least one of said eleotrode compartments comprises an electrolyte compartment in contact with the ion exchange membrane, a porous electrode component in contact with said electrolyte compartment and a gas chamber in contact with the porous electrode component on a side opposite the side contacting the electrolyte compartment;

said cell structure additionally having a central barrier which physically separates an anode compartment of an electrolysis cell located on one side of the barrier from a cathode compartment of an adjacent electrolysis cell located on the opposite side of the barrier;

said central barrier at least having a planarly disposed anode component situated in its adjacent anode compartment and at least having a planarly disposed cathode component situated in its adjacent cathode compartment;

said central barrier having the anode component of the adjacent anode compartment electrically connected through it to the cathode component of the adjacent cathode compartment;

said anode and cathode compartments which are adjacent to the central barrier having a peripheral structure around their periphery to complete the physical definition of said compartments;

said central barrier forming part of a gas compartment in the compartment adjacent to a depolarized electrode;

said cell structure also having an electrical current transfer means associated with it for providing electrical current paths through the central barrier from its adjacent cathode compartment to its adjacent anode compartment;

and which cell structure includes anode component and cathode component stand-off means for maintaining the anode component and cathode component of the two electrolysis cells adjacent to the central barrier at a predetermined distances from the central barrier;

the improvement which comprises:

the central barrier, the anode and cathode compartment peripheral structures, the anode component stand-off means, the cathode component stand-off means, and at least part of the electrical current transfer means all being integrally formed into a unitary central cell element made from a single casting of castable metal; and, further

said castable metal being electrically conductive so as to be the part of the electrical current transfer means which transfers electricity through the central barrier from the adjacent cathode compartment of the adjacent anode compartment; and

said unitary central cell element being formed in such a fashion so as to provide the structural integrity required to physically support the contents of the adjacent electrolyte compartments as well as to support the associated electrolysis cell appurtenances which are desired to be supported by the unitary central cell element; and

said anode component stand-off means and that part of the electrical current connecting means located in the unitary central cell element on the anode side of the central barrier being combined into a multiplicity of anode component bosses projecting a predetermined distance outwardly from the central barrier into the anode compartment adjacent to the central barrier, said anode component bosses being capable of being mechanically and electrically connected either directly or indirectly to the anode component of said anode compartment; and

said cathode component stand-off means and that part of the electrical current connecting means located on the cathode side of the central barrier being combined into a multiplicity of cathode component bosses projecting a predetermined distance outwardly from the central barrier into the cathode compartment adjacent to the central barrier, said cathode component bosses being capable of being mechanically and electrically connected either directly or indirectly to the cathode component; and

said anode component bosses being spaced apart in a fashion such that fluids or gases can freely circulate throughout at least a portion of the adjacent anode compartment, and, likewise, said cathode component bosses being spaced apart in a fashion such that fluids or gases can freely circulate throughout at least a portion of the adjacent cathode compartment;

a gas inlet passing through the peripheral structure of the central barrier into the one of the electrode chambers between the central barrier and its electrode component, an integral gas compartment inside an electrolyte compartment with a sealable face.

24. A process of electrolyzing sodium chloride brine comprised of passing electricity through a series of electrolysis cells whose cell structures are comprised of adjoining unitary cell elements like those defined in claim **1**.

4,560,453
EFFICIENT, SAFE METHOD FOR DECOPPERING COPPER REFINERY ELECTROLYTE

James E. Hoffman, Houston, Tex., and John S. Batzold, Paris, France, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

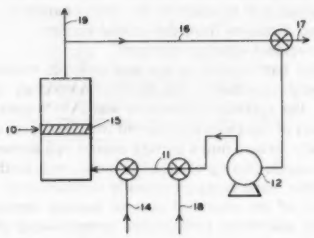
Filed Mar. 28, 1985, Ser. No. 717,431

Int. Cl.[4] C25C *1/12*

U.S. Cl. 204—106 **10 Claims**

1. In the process of electrowinning copper from copper electrorefining electrolyte solutions containing arsenic and

antimony wherein the copper concentration is sufficiently low that during electrolysis of such solutions toxic arsine and stibine gas would be formed at the cathode, the improvement comprising:



passing said copper solution and a fuel in contact with a fuel fed porous electrically conductive catalytic structure whereby copper is deposited on said structure without the evolution of arsine or stibine.

4,560,454

ELECTROLYSIS OF HALIDE-CONTAINING SOLUTIONS WITH PLATINUM BASED AMORPHOUS METAL ALLOY ANODES

Jonathan H. Harris, Shaker Heights; Michael A. Tenhover, Solon; Robert K. Grasselli, Aurora, all of Ohio, and Michael D. Ward, Newark, Del., assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Continuation-in-part of Ser. No. 605,700, May 1, 1984. This application Feb. 26, 1985, Ser. No. 705,687

Int. Cl.[4] C25B *1/24*

U.S. Cl. 204—128 **28 Claims**

1. A process for the generation of halogens from halide-containing solutions comprising the step of:

conducting electrolysis of said solutions in an electrolytic cell having a platinum based amorphous metal alloy anode having the formula

$$Pt_pA_aD_d$$

where

A is Cr, Mo, W, Fe, Os, Cu, Ni, Ag, V, Au and mixtures thereof;

D is B, Si, Al, Ge, P, As Sb, Sn and mixtures thereof;

p ranges from about 40 to 92;

a ranges from about 0 to 40; and

d ranges from about 8 to 60, with the proviso that $p+a+d=100$.

4,560,455

APPARATUS FOR STERILIZING OBJECTS WITH AN AQUEOUS HYPOCHLORITE SOLUTION

Augusto Porta, Carouge, Switzerland; Maurice Schaub, Perrignier; André Ayerbe, Reignier, both of France, and Guy Bunter, Carouge, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

PCT No. PCT/EP84/00023, § 371 Date Oct. 3, 1984, § 102(e) Date Oct. 3, 1984, PCT Pub. No. WO84/03045, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 1, 1984, Ser. No. 662,309

Claims priority, application Switzerland, Feb. 3, 1983, 609/83

Int. Cl.[4] C25B *15/08, 9/00*

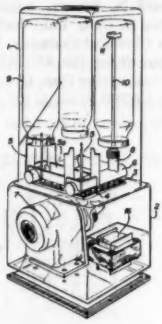
U.S. Cl. 204—130 **8 Claims**

1. A method of sterilizing objects which comprises the steps of:

positioning said objects within free space in an enclosure directly above a pair of electrodes;

introducing a sodium chlorite solution into said enclosure to form a solution contacting said electrodes but lying below said objects;

passing a direct current across said electrode to electrolyse said solution and form hypochlorite therein; and



continuously during the electrolysis of said solution, pumping hypochlorite-containing solution from the region of said electrodes and dispensing the pumped hypochlorite-containing solution onto exposed surfaces of said objects in said space.

4,560,456

MAGNETIC RECORDING MEDIA

Guenter Heil, Ludwigshafen; Werner Lenz, Bad Durkheim; Jenoe Kovacs, Hessheim; Werner Grau, Bobenheim-Roxheim, and Werner Balz, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,948

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332504

Int. Cl.[4] C08F *2/46*

U.S. Cl. 204—159.14 **1 Claim**

1. A magnetic recording medium which comprises a non-magnetic base and one or more magnetic layers consisting of an organic binder matrix containing finely divided magnetic material, the said matrix being obtained by electron beam curing of a mixture of from 70 to 90% by weight of a polyurethane acrylate polymer possessing polymerizable double bonds and from 10 to 30% by weight of one or more copolymerizable compounds, wherein the polyurethane acrylate polymer is composed of

(1) one or more diisocyanates,

(2) one or more oligomeric or polymeric diols,

(3) one or more low molecular weight diols, and

(4) one or more monohydroxyalkyl acrylates, and the amount of NCO groups of the diisocyanate is from 95 to 105% of the number of equivalents of OH groups of components 2, 3 and 4 and the molar amounts of the OH-containing components are chosen so that the concentration of urethane groups is from 2.7 to 4.2 moles per kg of polyurethane acrylate polymer, with the proviso that the number average molecular weight of the polymer is from 1,800 to 10,000, the ratio of the weight average to the number average molecular weight is from 2.4 to 3.5, and the copolymerizable compound is selected from the group consisting of

(a) acrylate prepolymers possessing two or more polymerizable acrylate double bonds,

(b) monomeric acrylates possessing two or more acrylate double bonds and

(c) N-vinyl monomers.

4,560,457

ADHESIVES FOR BONDING OPTICAL ELEMENTS

Kazufumi Ogawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 11, 1981, Ser. No. 329,821
Claims priority, application Japan, Dec. 19, 1980, 55-180723
Int. Cl.[4] C08F 8/00
U.S. Cl. 204—159.16 11 Claims

1. An adhesive adapted especially for bonding optical elements consisting essentially of a polyfunctional acrylate and a polythiol, which are major components, a free radical generating photoinitiator, a free radical generating heat-activated curing initiator, and a stabilizer,

(A) said polyfunctional acrylate being
di-pentaerythritol hexacrylate,
di-pentaerythritol pentacrylate or
a mixture thereof,

(B) said polythiol being
pentaerythritol tetrakis (thioglycolate),
trimethylol ethanetris (β-mercaptopropionate),
pentaerythritol tetrakis (3-mercaptopropylether),
a mixture consisting of any two of the above mentioned compounds or
a mixture of all of said compounds
the weight ratio of said polythiol to said polyfunctional acrylate being from 10:1 to 1:10.

4,560,458

METHOD FOR IMPROVING SURFACE PROPERTIES OF A SHAPED ARTICLE OF A SYNTHETIC RESIN

Susumu Ueno, and Hirokazu Nomura, both of Ibaraki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 575,505, Jan. 31, 1984, abandoned. This application Jan. 10, 1985, Ser. No. 690,380
Claims priority, application Japan, Jan. 31, 1983, 58-14460
Int. Cl.[4] C08J 7/12
U.S. Cl. 204—165 1 Claim

1. A method for improving the surface properties of a shaped article of a synthetic resin comprising the sequential steps of:

(a) exposing the surface of the shaped article to low temperature plasma generated in an atmosphere containing a nitrogen-containing organic compound; and then

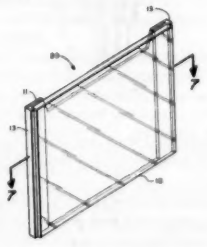
(b) exposing the surface of the shaped article treated in step (a) to low temperature plasma generated in an atmosphere containing a fluorine-containing organic compound.

4,560,459

VERTICAL GEL SANDWICH FOR USE IN ELECTROPHORESIS AND METHOD THEREFOR

Peter S. Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Feb. 21, 1984, Ser. No. 581,695
Int. Cl.[4] G01N 27/28
U.S. Cl. 204—182.8 5 Claims



1. A method of assembling a gel sandwich for use in electrophoresis comprising the following steps:

laying down one plate of a pair;

placing a pair of elongated straight T-shaped spacers with stems having planar parallel faces on opposite sides of said plate with the head of each T spacer flush against the side of the plate and the face of the stem of said T spacer being contiguous with said plate;

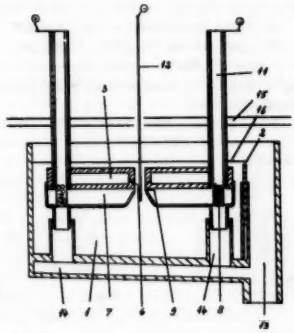
placing the other plate of said pair on said spacers with the sides of such plate flush against the respective heads of said T spacers and with the faces of the respective stems contiguous to the plates whereby a sandwich is formed and having a slot and the top and bottom of said gel slot remain open to allow application of a voltage to a gel in said slot for electrophoretic separation; and pouring gel into said slot in said sandwich.

4,560,460

APPARATUS FOR THE GALVANIC DEPOSITION OF METAL

Horst Blüsing, and Manfred Kallweit, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,558
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317970
Int. Cl.[4] C25D 17/02, 17/28
U.S. Cl. 204—224 R 11 Claims



1. Arrangement for the galvanic deposition of metal, of the type having an electrolysis tub with overflow, electrodes, nozzles, connecting conduit tubes, pumps, control system and dosaging system as well as electrical appurtenances, wherein a cathodically-connected and to be galvanized work piece is disposed between two nozzles,

each said nozzle being formed from two chambers located one above the other and with separate outlets and entrances,

an upper of said chambers contains an electrolyte exit-opening in the form of a slit, and

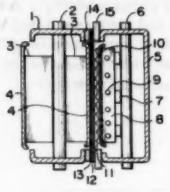
a lower of said chambers comprises a shaft-shaped construction for the purpose of projecting thereinto the chamber applied insulated anodes, and is provided with an anode niche, said anode niche defining at the height of said slit a vertically-adjusted opening having a cross-section from 300 to 2500 mm^2.

4,560,461

ELECTROLYTIC CELL FOR USE IN ELECTROLYSIS OF AQUEOUS ALKALI METAL CHLORIDE SOLUTIONS

Toshimasa Okazaki, Okazaki, and Shuta Nakagawa, Nagoya, both of Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,582
Int. Cl.⁴ C25B *9/00, 11/03, 13/08*
U.S. Cl. 204—252 **8 Claims**



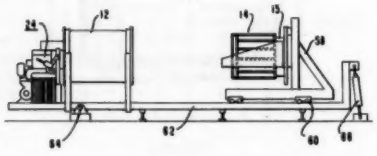
1. A cathode structure for use in an electrolytic cell of the vertical type for electrolysis of aqueous alkali metal chloride solutions, coprising a vertical cathode, a flexible and foraminate metal mesh of low hydrogen-over-voltage vertically and removably mounted on one side of said cathode, an essentially hydraulically permeable and hydrogen gas bubbles impenetrable, non-metallic microporous film vertically and removably mounted on said metal mesh and a cation exchange membrane vertically and removably mounted on said non-metallic microporous film, in such a way that the cathode, the metal mesh, the non-metallic microporous film and the cation exchange membrane can be pressed against each other and brought into close contact with each other by means of an expandable anode.

4,560,462

APPARATUS FOR COATING NUCLEAR FUEL PELLETS WITH A BURNABLE ABSORBER

Kenneth C. Radford, Irwin; Herbert W. Keller, Monroeville, both of Pa.; Beryl H. Parks, Lexington, and Robert R. Fuller, Columbia, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1984, Ser. No. 623,747
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—298 **17 Claims**



1. Apparatus for depositing a coating on nuclear fuel pellets, comprising:

(a) a generally cylindrical drum rotatable about its longitudinal axis, the circumferential part of said drum having a portion with an open area;

(b) an enclosed pallet having a lower screened part and a detachable upper screened part with said lower and upper screened parts spaced apart at a distance allowing said pellets to be disposed only in a single layer within said pallet between said lower and upper screened parts, said pallet disposable generally in said open area of said drum and, there disposed, removably attachable to said drum with said upper and lower screened parts facing along a general radial direction;

(c) a chamber, said drum disposable within said chamber with the longitudinal axis of said drum oriented generally horizontally, said chamber with the disposed said drum defining a hermetically sealed unit;

(d) means for rotating said drum about its longitudinal axis;

(e) means for sputtering said coating on said pellets, said sputtering means, when said drum is disposed within said chamber, having a stationary, sputter-frangible, upper target disposed inside and proximate the circumferential part of said drum at a location which is above the longitudinal axis of said drum and which is at a longitudinal distance corresponding to that of said open area of said drum, said stationary upper target oriented to face generally upward and radially outward to sputter said coating onto those areas of said pellets, in said pallet on the rotating said drum, which are exposed to said stationary upper target as said pallet rotates past, said sputtering means, when said drum is disposed within said chamber, also having a stationary sputter-frangible, lower target disposed outside and proximate the circumferential part of said drum at a location which is below the longitudinal axis of said drum and which is at a longitudinal distance corresponding to that of said open area of said drum, said stationary lower target oriented to face generally upward and radially inward to sputter said coating onto those areas of said pellets, in said pallet on the rotating said drum, which are exposed to said stationary lower target as said pallet rotates past; and

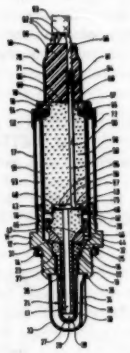
(f) means for controlling said drum rotating means and said sputtering means.

4,560,463

GAS SENSOR, PARTICULARLY OXYGEN SENSOR EXPOSED TO COMBUSTION EXHAUST GASES

Thomas Frey, Friolzheim; Werner Grünwald, Gerlingen; Günther Knoll, Stuttgart, and Helmut Weyl, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,584
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327991
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—424 **13 Claims**



1. Gas sensor, particularly to determine oxygen content in combustion exhaust gases, especially from an internal combustion engine having

an elongated tubular housing (**11**, **17**) defining a sensing end portion and a connecting end portion of the sensor;

a tubular solid electrolyte sensing element (**26**), closed at the sensing end portion located at the sensing end portion of the housing and secured therein, and having layer electrodes (**28**, **30**) thereon extending over, respectively, an outer and an inner surface thereof;

An electrical heating element (36) located within the tubular solid electrolyte element having a layer heater means (37) terminating in two heater connecting zones (40, 40'), said heater element (36) comprising an elongated rod portion and a flange end portion,

said layer heater means extending on the rod portion,

said flange end portion having a diameter larger than the diameter of the elongated rod portion, being located at the end remote from the closed end of the tubular electrolyte, and having an end face (39) facing the connecting end portion of the sensor,

said heater connecting zones (40, 40') being located on said end face (39),

a plurality of electrically conductive tracks (38, 48) formed on said heater element, a first (48) of said tracks being in electrical contact with that one (30) of the layer electrodes of the sensing element at the inner surface of the sensing element and extending to a connecting zone (49) on the end face (39) of the heater element, and

a second (38) and a third (38) of said tracks connecting said heater means with the heater connecting zones (40, 40') on the end face (39) of the heater element,

and electrical connection means (58) extending within the housing and in electrical contact with the respective electrically conductive connection portions and leading to the terminal end of the connecting portion of the sensor.

4,560,464

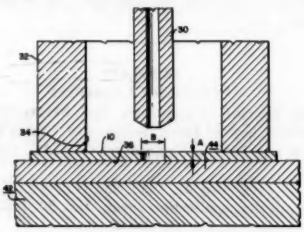
STICK-ON-MASK FOR USE WITH COULOMETRIC MEASURING INSTRUMENTS

Sidney Lieber, 426 E. Shore Rd., Great Neck, N.Y. 11024

Continuation of Ser. No. 244,693, Mar. 17, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,546

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—434 **2 Claims**



1. For use in coulometric measurement apparatus for determining the thickness of a thin metal coating on a workpiece substrate through timed deplating thereof, said apparatus having

an electrolyte container,

grommet means dependent from the base of said electrolyte container and disposed in fluid communication with the interior thereof,

said grommet means having a dependent end portion defining an aperture sized to perimetrically define a relatively large area of said workpiece substrate exposable to said electrolyte and a sealed perimetric interface thereabout,

means for positioning said grommet means in operative abutting relation with said workpiece substrate,

the improvement comprising,

means for delivering a stream of electrolyte to the dependent end of said grommet means,

means for connecting said electrolyte stream delivery means to a source of electrical potential of one polarity and said workpiece substrate to a source of electrical potential of opposite polarity to permit deplating of said portion of said thin metal coating exposed to said electrolyte from said workpiece substrate,

a thin planar mask intermediate said workpiece substrate surface and the dependent end of said grommet means,

said mask being of essentially non-compressible electrolyte impermeable material having an aperture therein of relatively small area compared to that of the aperture in said grommet means and perimetrically contoured to define an exposed area of said thin metal coating to be subjected to said electrolyte, and

an electrolyte impermeable adhesive coating on one surface of said mask for removably securing said mask to the substrate with the perimetric edges of said mask aperture adhesively secured in electrolyte-tight relation with said thin metal layer to precisely define the area thereof to be exposed to said electrolyte,

said mask being sized to be engaged by the dependent end portion of said grommet means at a location remote from said relatively small aperture therein to prevent escape of electrolyte from said electrolyte container.

4,560,465

PRESULFIDED RED MUD AS A FIRST-STAGE CATALYST IN A TWO-STAGE, CLOSE-COUPLED THERMAL CATALYTIC HYDROCONVERSION PROCESS

S. Gary Yu, Oakland, and John G. Reynolds, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1984, Ser. No. 644,738

Int. Cl.⁴ C10G *65/00*

U.S. Cl. 208—59 **21 Claims**

1. A two-stage, close-coupled process for hydroprocessing a heavy hydrocarbonaceous feedstock at least 30 volume percent of which boils above 1000° F. and which has greater than 100 parts per million by weight total metal contaminants to produce high yields of transportation fuels boiling below 650° F., which comprises:

(a) introducing said feedstock and dispersed presulfided red mud having activity sufficient to suppress adverse coke formation under coking conditions and having demetalizing activity, into a first-stage hydrothermal zone in the presence of hydrogen or a mixture of hydrogen and hydrogen sulfide; wherein said feedstock and red mud are introduced into said hydrothermal zone under conditions sufficient to substantially demetalate said feedstock and to convert a significant amount of the hydrocarbons of said feedstock boiling above 1000° F. to hydrocarbons boiling below 1000° F.;

(b) rapidly, and without substantial reduction of pressure through the system, passing a substantial portion of the red mud entrained effluent of said first-stage hydrothermal zone directly into a second-stage catalytic reaction zone at a reduced temperature relative to said first-stage hydrothermal zone and contacting said effluent with hydroprocessing catalyst under hydroprocessing conditions, including a temperature in the range of 650° F. to 800° F.; and

(c) recovering the effluent from said catalytic reactor zone.

4,560,466

HYDRODEMETALLIZATION OF HEAVY OILS IN THE PRESENCE OF WATER

Simon G. Kukes, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1984, Ser. No. 665,853

Int. Cl.⁴ C10G *45/34, 45/00*

U.S. Cl. 208—89 **22 Claims**

1. A process for at least partially removing at least one metal from a hydrocarbon containing feed stream, which also contains metals, by simultaneously contacting said feed stream under demetallization conditions with water, hydrogen and a catalyst composition comprising (a) aluminum phosphate, and (b) at least one metal component selected from the group of

metals belonging to Group VIB of the periodic Table, wherein water is added as a substantially liquid stream and is at least partially mixed with said hydrocarbon feed stream before said simultaneous contacting with hydrogen and the catalyst composition, and the liquid volume ratio of water to the hydrocarbon feed stream ranges from about 1:50 to about 1:1.

4,560,467

VISBREAKING OF OILS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1985, Ser. No. 722,626
Int. Cl.[4] C10G *29/02, 45/00*
U.S. Cl. 208—89 **20 Claims**

19. A process comprising the step of

(A) intimately contacting a substantially liquid hydrocarbon feed stream, which also contains metal impurities selected from the group consisting of nickel and vanadium compounds, with a carbon monoxide containing gas, at a temperature ranging from about 300° C. to about 550° C. under such reaction conditions as will result in a hydrocarbon containing stream having a reduced level of metal impurities and an increased API^{60} gravity, essentially in the absence of a homogeneous or heterogeneous catalyst and essentially in the absence of a second liquid phase which can extract any portion from the hydrocarbon containing feed stream, wherein at least a portion of said metal impurities is converted to a precipitate dispersed in the liquid portion of said hydrocarbon containing stream.

4,560,468

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Robert J. Hogan; Daniel M. Coombs; Thomas Davis, and Howard F. Efner, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1984, Ser. No. 596,982
Int. Cl.[4] C10G *45/12, 47/12, 47/16*
U.S. Cl. 208—110 **22 Claims**

1. A process for hydrofining a hydrocarbon-containing feed stream which contains metals comprising the steps of:

introducing a decomposable molybdenum dithiophosphate compound into said hydrocarbon-containing feed stream, wherein a sufficient quantity of said decomposable molybdenum dithiophosphate compound is added to said hydrocarbon-containing feed stream to result in a concentration of molybdenum in said hydrocarbon-containing feed stream in the range of about 1 to about 60 ppm; and

contacting said hydrocarbon-containing feed stream containing said decomposable molybdenum dithiophosphate compound under hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table.

4,560,469

CATALYTIC DEWAXING PROCESS

P. Donald Hopkins, St. Charles; Thomas D. Nevitt, and Eugene E. Unmuth, both of Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 24, 1984, Ser. No. 686,078
Int. Cl.[4] C10G *45/60*
U.S. Cl. 208—110 **17 Claims**

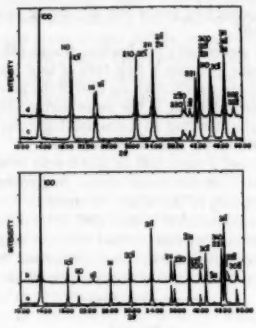
1. A process for catalytically dewaxing thereby reducing the pour point of a hydrocarbon feedstock which process comprises contacting the feed with hydrogen under catalytic dewaxing conditions in the presence of a catalyst composition comprising a crystalline borosilicate molecular sieve and a hydrogenation component consisting essentially of nickel.

4,560,470

HYDRODESULFURIZATION CATALYSIS BY CHEVREL PHASE COMPOUNDS

Kevin F. McCarty, Livermore, Calif., and Glenn L. Schrader, Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 20, 1985, Ser. No. 736,154
Int. Cl.[4] C10G *45/04, 45/08*
U.S. Cl. 208—215 **17 Claims**



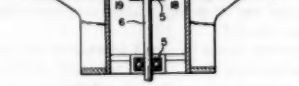
1. A hydrodesulfurization process comprising, contacting a sulfur-containing gaseous hydrocarbon with a chevrel phase compound of the general formula: $M_xMo_6S_8$ at a concentration and for a time sufficient to selectively reduce the sulfur content of the hydrocarbon, wherein M is selected from large and intermediate cations for chevrel phase compounds and M and x are selected to maintain the oxidation state of most of the Mo to less than +4.

4,560,471

POWDER CLASSIFIER

Yukiyoshi Yamada, Tokorozawa, and Masayuki Yasuguchi, Sagamihara, both of Japan, assignors to Nisshin Flour Milling Co. Ltd. and Nisshin Engineering Co., Ltd., both of Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,235
Claims priority, application Japan, Jun. 30, 1982, 57-113337
Int. Cl.[4] B07B *7/083*
U.S. Cl. 209—144 **1 Claim**



1. A powder classifier comprising:

(a) a casing containing at an upper center thereof a powder charge port and, at the periphery of outer side walls thereof, air intake ports;

(b) a rotary shaft vertically supported by bearings along the axis of said casing;

(c) a classification rotor having a hollow interior within said casing, secured to the upper end of said rotary shaft;

(d) a series of classification blades within the outer circumferential opening of said hollow interior of said classifica-

tion rotor wherein said series of classification blades consists of a multitude of outside classification blades distinctly separated from a multitude of inside classification blades wherein said outside and inside classification blades are in face-to-face relation with each other and further wherein said series of classification blades intersect the radial directions of said classifier in an angle of between 20° and 70°;

(e) a powder charge opening on the upper plate of said classification rotor in face-to-face relation with the space existing between said outer and inner classification blades; and

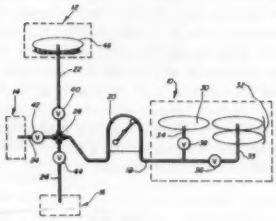
(f) a series of auxiliary blades on the undersurface of said classification rotor; wherein the angle of intersection with radial directions of said series of said auxiliary blades is between 20° and 70°.

4,560,472

PERITONEAL DIALYSIS APPARATUS

Daniel B. Granzow, Ingleside; Arthur L. Lueders, Mundelein, both of Ill.; Ralph L. Davis, Burlington, Wis.; Stanley J. Pernic, Round Lake, Ill.; James R. Hitchcock, Jr., and Francis D. Buckley, both of Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 10, 1982, Ser. No. 448,450
Int. Cl.[4] B01D *31/00*
U.S. Cl. 210—140 **12 Claims**



1. In a peritoneal dialysis apparatus having a dialyzate supply station, a heater and measuring station, solution delivery means, a drain and measuring station, a first fluid flow path communicating with said dialyzate supply station and said heater and measuring station, a second fluid flow path communicating with said heater and measuring station and said solution delivery means, a third fluid flow path communicating with said solution delivery means and said drain and measuring station, the improvement comprising:

means for pumping dialyzate through said first flow path;

first valve means comprising independently operable first and second tubing occluding means for controlling fluid flow in said first fluid flow path;

second valve means comprising said second tubing occluding means and a third independently operable tubing occluding means for controlling fluid flow in said second fluid flow path;

third valve means comprising said third tubing occluding means and an independently operable fourth tubing occluding means for controlling fluid flow in said third fluid flow path; and,

control means including said valve means for dictating the time intervals during which:

said first and second tubing occluding means are opened to open said first valve means and said pump means is pumping to allow fluid flow in said first fluid flow path while said third and fourth tubing occluding means are closed to close said second valve means and said third valve means to prevent fluid flow in said second fluid flow path and in said third fluid flow path;

said second and third tubing occluding means are opened to open said second valve means to allow fluid flow by gravity in said second fluid flow path while said first and fourth tubing occluding means are closed to close said first valve means and said third valve means and said pump means is not pumping, to prevent fluid flow in said first fluid flow path and in said third fluid flow path; and

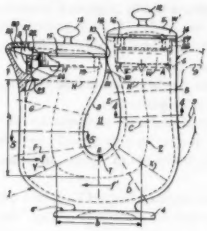
said third and fourth tubing occluding means are opened to open said third valve means to allow fluid flow by gravity in said third fluid low path while said first and second tubing occluding means are closed to close said first valve means and said second valve means and said pump means is not pumping, to prevent fluid flow in said first fluid flow path and in said second fluid flow path.

4,560,473

MACERATOR-DECANTER

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Aug. 27, 1984, Ser. No. 644,794
Int. Cl.[4] B01D *11/02*
U.S. Cl. 210—173 **14 Claims**



1. A macerator-decanter vessel comprising:

means for introducing fresh steeping liquid and fresh solid matter to be steeped, in lump form, at one inlet end of a double-ended curved vassel;

means for extracting the processed steeping fluid at the other end of said vessel, said end being the outlet end;

means for separating said liquid from the steeped solid matter at the outlet end of said vessel;

means for allowing the direct extraction of the processed steeped solid lumpy matter at the outlet end of said vessel;

means for containing and storing the mixture of liquid and solid matter while the maceration and decanting processes take place inside said vessel;

means for facilitating the automatic progression of the liquid and solid mixture from the inlet end to the outlet end, as the maceration and decanting processes take place, each time fresh solid matter is added and each time fully steeped solid matter is extracted, said solid matter progression being always substantially in the same direction, from inlet to outlet; and

wherein: (1) the inlet end and the oulet end are circularly shaped and tangentially joined together in a manner such that the vessel centerline substantially completes a 180-degree turn from one end to the other; (2) both inlet and outlet ends are closed by means of removable lids; (3) the lower midsection portion of the vessel includes a footing platform, thereby enabling the vessel to stand vertically on a substantially horizontal surface; (4) an opening is provided between the vessel lower portion and both sides of the U-shape so formed by the vessel centerline 180-degree turn, lessening thereby the degree of curvature of the vessel lower portion and vessel bottom and providing grasping means of the vessel with one hand, also thereby increasing the degree of stability of the vessel by lowering its center of gravity; and (5) the cross-sectional areas of the vessel internal volume progressively augment in size, from the inlet end to the outlet end, thereby providing

means for facilitating the progression of the solid matter on its way from the inlet end to the outlet end.

4,560,474

FLOTATION APPARATUS FOR FLOATING FIBER SUSPENSIONS EXTRACTED FROM WASTE PAPER

Herbert Holik, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,439

Claims priority, application Switzerland, Feb. 18, 1983, 924/83

Int. Cl.⁴ B01D *21/26*

U.S. Cl. 210—221.2 **7 Claims**

1. A flotation apparatus for floating fiber suspensions obtained from waste paper, comprising:

a vessel defining a substantially rotationally symmetrical container having a circumference;

delivery means provided for said vessel for delivery and simultaneously aerating a fiber suspension to be floated;

said container having a substantially vertical axis;

said container including an upper region and a lower region;

said delivery means being disposed in said upper region of said container;

said delivery means comprising at least one vortex channel leading to said container;

said at least one vortex channel being provided with at least one stepped enlargement;

said stepped enlargement comprising at least two channel segments separated by a widened portion for inducing intensive microturbulence in fiber suspensions passed therethrough;

said at least one vortex channel having a predetermined region situated between its ends and comprising the widened portion separating said at least two channel segments of said stepped enlargement;

at least one air conduit for the delivery of flotation air opening into said at least one vortex channel in said predetermined region;

means defining a progressively tapering nozzle channel located downstream of said at least one vortex channel and disposed in tangential relationship to said circumference of said container;

said container being provided with an outlet for good stock and a further substantially vertically adjustable outlet for flotation foam;

said outlet for good stock comprising first extraction means for extracting the good stock disposed in said lower region of said container; and

said further substantially vertically adjustable outlet for flotation foam comprising a substantially vertically adjustable second extraction means for extracting the flotation foam and arranged in said upper region of said container.

4,560,475

FILTER ASSEMBLY WITH SUPPORTING EDGES

Joji Kataoka, Tokyo, Japan, assignor to Kataoka Bussan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 328,512, Dec. 8, 1981, abandoned. This application Dec. 20, 1983, Ser. No. 563,375

Claims priority, application Japan, Dec. 27, 1980, 55-185091; Mar. 7, 1981, 56-031751; Mar. 24, 1981, 56-040286; Apr. 16, 1981, 56-053789; Jul. 25, 1981, 56-109796; Aug. 12, 1981, 56-118711; Aug. 12, 1981, 56-118712; Aug. 14, 1981, 56-119955; Sep. 3, 1981, 56-130371

Int. Cl.⁴ B01D *23/28*

U.S. Cl. 210—249 **15 Claims**

1. A filter assembly which is adapted to be mounted on a receptacle, comprising: a sheet in the form of a resilient, manually deformable generally rectangualr support plate having transverse end edges and longitudinal side edges and an intermediate portion defining an opening therein for pouring hot water therethrough, said support plate including a grasping means for securely mounting said support plate on the receptacle, said grasping means including a generally U-shaped slot therein, adjacent to but spaced from a support plate end edge said slot having a bottom portion extending parallel to the support plate end edge and a pair of wing portions each extending substantially toward said intermediate portion; said grasping means including an outer nipping strip formed by that portion of said support plate located between said end edge and said slot bottom portion and being continuous from one support plate side edge to the other whereby said outer nipping strip is continuous and includes essentially the entire support plate end edge, said grasping means further including an inner nipping tongue separated from said outer nipping strip by said

slot, said inner nipping tongue being shaped to conform with the shape of said slot and being co-planar with said outer nipping strip when said support plate is in a planar configuration so that when said outer nipping strip is positioned on one side of the receptacle and said inner nipping tongue is positioned on another side of the receptacle, the resilient nature of said support plate tends to force said inner nipping tongue against the receptacle and tends to force said outer nipping strip against the receptacle at essentially all locations adjacent to said inner nipping tongue whereby said outer nipping strip cooperates with essentially all of said inner nipping tongue to securely grasp the receptacle; and a sack of filter paper covering the opening in the intermediate portion.

4,560,476

STRAINER FOR SUBMERGIBLE PUMP

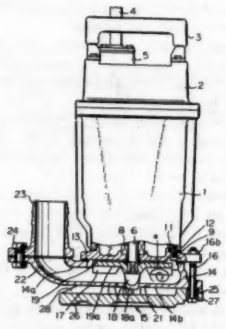
Sinji Nishimori, Kanagawa, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,896

Claims priority, application Japan, Apr. 30, 1983, 58-66029[U]

Int. Cl.⁴ B01D *35/02*

U.S. Cl. 210—416.1 **5 Claims**



1. A strainer for use in a submergible pump wherein suctioning flow is generally directed from the peripheral portion to the central portion of the strainer, said strainer comprising:

(a) a base member and

(b) a plurality of stoppers disposes perpendicularly relative to said base member at the peripheral portion thereof,

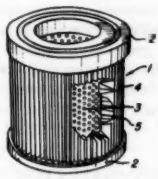
each said stoppers extending in the direction of the suctioning flow, the height of said stoppers being short of the total height of the strainers so that a flow passage is provided at the axial tip of each of said stoppers communicating the passages at the opposite side surfaces of said stopper with each other, each of said stoppers being given a slanted edge at the portion near the central poriton of the stainer, an upright edge parallel to a pump axis near the outer periphery of the strainer, and a tip edge connecting said slanted edge and said upright edge while leaving a space between said tip edge and the outer surface of the pump casing within the range of the total height of the strainer.

4,560,477

SEPARATOR FOR FILTER CARTRIDGES

Preben G. Moldow, Hägendorf, Switzerland, assignor to 501 P.M. Filter Konstruktionen, Switzerland

Filed Nov. 21, 1983, Ser. No. 553,778
Claims priority, application Denmark, Nov. 22, 1982, 5187/82
Int. Cl.[4] B01D *27/06*
U.S. Cl. 210—457 **5 Claims**



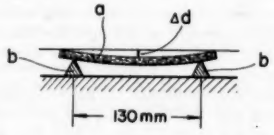
1. In a separator arrangement for filter cartridges wherein a pleated filter element is disposed around a centrally located perforated tube and wherein separators are located in the pleats of the filter element, the improvement wherein the separators each comprise an elongate member providing substantial rigidity and extending along substantially the entire length of the filter pleat in which the separator is located, said separators each including pyramidal pleats therein which extend generally transverse to the filter pleat in which the separator is located, each separator member extending between the perforated tube at one lateral edge and the apex of the filter pleat in which the separator is located at the other lateral edge and the amplitude of the separator pleats in each separator member increasing from substantially zero at the edge of the separator member adjacent to the apex of the filter element pleat in which the separator member is located to a maximum at the edge adjacent to the perforated tube.

4,560,478

POROUS CERAMIC ARTICLE

Tsuneaki Narumiya, Yokohama, Japan, assignor to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,395
Claims priority, application Japan, Feb. 26, 1982, 57-31071; Dec. 17, 1982, 57-221590
Int. Cl.[4] B01J *9/04*; B32B *5/18*
U.S. Cl. 210—496 **10 Claims**



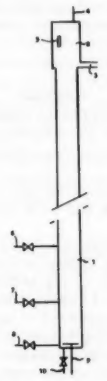
1. A porous ceramic article comprising a porous ceramic body having a three-dimensional network of strands defining interconnected cells, characterized in that the porous ceramic body has a bulk specific gravity of 0.25 to 0.6, an average pore diameter of 0.3 to 10 mm, a porosity of 75 to 95%, and an air pressure drop of 0.1 to 30 mm in water gauge when air passes through the porous ceramic body over a thickness of 1 cm at a velocity of 1 m/sec, and needle-like crystals dispersed in the porous ceramic body which is formed by heating a ceramic material containing 70–92% by weight of alumina on the basis of the weight of the porous ceramic body, deposited on the strands of the porous ceramic body.

4,560,479

PROCESS FOR PREPARING BIOMASS ATTACHED TO A CARRIER

Joseph J. Heijnen, T's-Gravenhage, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Continuation-in-part of Ser. No. 182,068, Aug. 28, 1980, abandoned. This application Jan. 27, 1983, Ser. No. 461,635
Claims priority, application Netherlands, Nov. 7, 1979, 7908138
Int. Cl.[4] C02F *3/06, 3/28*; C12P *5/02*
U.S. Cl. 210—603 **18 Claims**

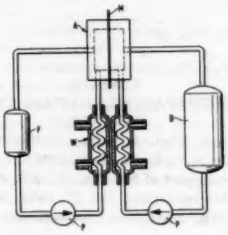


1. In a process for the start up and operation of a fluidized bed reactor for the production and maintenance of well-adhering biomass attached to carrier particles capable of decomposing contaminants without sludge production in waste water containing both well-adhering and non-adhering microorganisms wherein granular carrier particles of at least 0.1 mm and with a specific gravity of 2 to 5 g/ml are contacted in a reaction space with a continuous upwardly flowing stream of waste water containing both well-adhering and non-adhering microorganisms and nutrients for the growth of the microorganisms in an adhering layer until a sufficiently thick, well-adhering layer of microorganisms is formed on the carrier, the improvement comprising maintaining the residence time of the waste water in the reaction space lower than the reciprocal maximum growth rate of the microorganisms on carrier particles while generating in the waste water in the reaction space shear forces caused by liquid motion and circulation and caused by gas bubbles only wherein the mechanical energy dissipation is approximately 0.01 to 1.5 kw per m^3 of reaction liquid thereby washing out of the reaction space all non-adhering microorganisms by the passage of waste water through the reaction space while the thickness of the well-adhering layer remains constant on the carrier which remains in the reaction space.

4,560,480
PROCESS FOR CONVERTING SPARINGLY SOLUBLE SALTS OF ANIONIC DYES AND FLUORESCENT BRIGHTENERS INTO MORE SOLUBLE SALTS BY MEANS OF CATION EXCHANGE

Roger Lacroix, Village-Neuf, France, and Hans-Rudolf Marfurt, Rheinfelden, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,485
Claims priority, application Switzerland, May 4, 1983, 2425/83
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 11 Claims



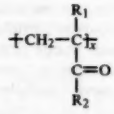
1. A process for converting sparingly soluble salts of anionic dyes and brighteners into more soluble salts by means of cation exchange without intermediate isolation of the free dye acid, which comprises carrying out the cation exchange by using Donnan dialysis.

4,560,481
METHOD OF CONTROLLING IRON INDUCED FOULING IN WATER SYSTEMS

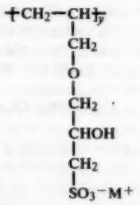
Orin Hollander, Langhorne, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 13, 1984, Ser. No. 681,054
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—697 7 Claims

1. A method of inhibiting corrosion and controlling deposition in a cooling water system of the type comprising iron species present in said cooling water in a deposit forming amount and under deposit forming conditions, wherein surface active Fe^{+3} ions are admitted to said cooling water, said method comprising adding to said cooling water an effective amount of a water soluble copolymer comprising repeat unit moieties (a) and (b) wherein said repeat unit moiety (a) comprises the structure:



and wherein said repeat unit (b) comprises the structure:

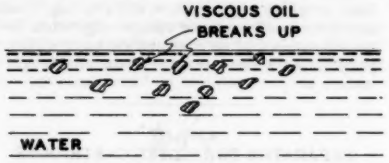


wherein x and y are integers and the ratio of x:y is in the range of about 10:1 to 1:5, R_1 is H or lower alkyl (C_1–C_3), R_2 is OH, OM, or NH_2, M is H or a water soluble cation.

4,560,482
CHEMICAL DISPERSANT FOR VISCOUS OILS

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 8, 1983, Ser. No. 559,458
Int. Cl.[4] C02B *9/02*
U.S. Cl. 210—749 5 Claims

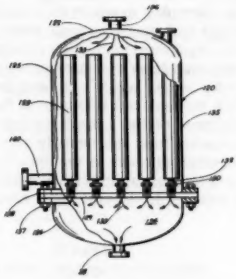


3. A method of dispersing semi-solid oils having a viscosity of from about 1000 to 10,000 centipoise in water comprising applying a dispersant composition to said oil when said oil is on the surface of a body of water, said dispersant composition having a viscosity which is at least 10% of the viscosity of said oil and consist essentially of a non-ionic surfactant selected from the group consisting of polyoxyethylene sorbitan fatty acid esters and sorbitan fatty acid esters, an oil soluble polymer selected from the group consisting of polyisobutylene, ethylene-propylene copolymers, polydimethyl siloxane, polypropylene oxide, cis polyisoprene, cis polybutadiene and polystyrene and a petroleum oil.

4,560,483
PROCESS AND APPARATUS FOR FILTRATION OF OIL AND GAS WELL FLUIDS

Theodore J. Warning, 11227 Rippling Meadows, Houston, Tex. 77064, and John A. Cairo, Jr., 16826 Shady Arbor La., Baton Rouge, La. 70817

Filed May 4, 1984, Ser. No. 606,966
Int. Cl. B01D *37/02*
U.S. Cl. 210—777 14 Claims



1. A process for filtering a contaminated oil/gas well fluid stream, comprising the steps of:

a. providing a filter vessel;

b. introducing a fluid containing filter media into the vessel;

c. forming a primary filter cake with the filter media inside the vessel;

d. supporting the primary filter cake on the outside surface of a continuous support screen having sufficient structural integrity to prevent screen aperture deformation under increasing pressure differential after solids accumulation thereupon;

e. introducing contaminated oil/gas well fluids into vessel;

f. removing solid material that flows downstream from the media with a secondary guard filter that is positioned in the vessel adjacent the continuous support screen; and

g. withdrawing filtrate from the downstream side of the filter media, the support screen, and the secondary guard filter.

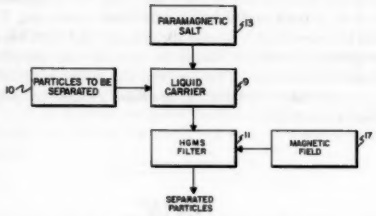
4,560,484
METHOD AND APPARATUS FOR MAGNETICALLY SEPARATING PARTICLES FROM A LIQUID

Fritz J. Friedlaender, and Makoto Takayasu, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 143,607, Apr. 25, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,411

Int. Cl.⁴ B01D *35/06*

U.S. Cl. 210—796 **16 Claims**



1. A method for magnetically separating particles from a liquid, said method comprising:

modifying a liquid having particles to be separated therein by addition of a diamagnetic material to modify said liquid so that said liquid is thereby made a predetermined diamagnetic liquid relative to particles therein;

establishing a magnetic field;

placing magnetic material having curved surfaces in said magnetic field to establish a high gradient magnetic field related to said curved surfaces so that said magnetic material acts as a particle filter therein; and

passing said modified liquid through said magnetic material in a direction relative to said magnetic material and said magnetic field so as to cause attraction of said particles to said magnetic material while allowing passage of said modified liquid past said magnetic material to thereby achieve separation of said particles from said modified liquid.

13. A method for selective separation of particles in a liquid, said method comprising:

modifying a liquid having at least one group of particles therein which are to be separated from said liquid and at least a second group of particles in said liquid, said liquid being modified by adjusting the magnetic susceptibility of said liquid to be substantially identical to that of said second group of particles;

establishing a magnetic field;

placing a magnetic matrix in said magnetic field to form a high gradient magnetic filter; and

passing said modified liquid through said filter in a direction relative to said magnetic matrix and said magnetic field so as to cause separation of said one group of particles from said modified liquid and said second group of particles by attraction of said particles of said one group to said magnetic matrix.

4,560,485
FIRE-FIGHTING POWDERS

Éva Székely, and Róza Székely, both of Budapest, Hungary, assignors to Magyar Szénhidrogénipari Kutató-Fejlesztö Inté zet, Százshalombatta, Hungary

Filed Apr. 16, 1984, Ser. No. 600,757

Claims priority, application Hungary, Apr. 21, 1983, 1387/83

Int. Cl.⁴ A62D *1/00, 1/06*

U.S. Cl. 252—7 **7 Claims**

1. A fire fighting powder composition, comprising:

(a)

(1) at least one sesquicarbonate of potassium, sodium and ammonium in an amount of from about 10 to about 95% by weight, or

(2) at least one of (i) bisulfate, sulfate, biphosphate, phosphate, bicarbonate, sesquicarbonate, carbonate and halide, of at least one of sodium, potassium and ammonium, (ii) alkaline metal borate, (iii) boric acid, and (iv) their adducts with at least one of urea, guanidine, melamine and dicyandiamide, in an amount of about 5% to about 90% by weight,

(b) a water soluble metal salt catalyst which is at least one salt of at least one of copper, nickel, manganese, cobalt, chromium and iron in an amount of from 0.1% to 10% by weight, and

(c) a hydrophobizing agent which is at least one of a metal stearate and a silicone derivative in an amount of 1% to 3% by weight.

4,560,486
BREAKER SYSTEM FOR HIGH VISCOSITY FLUIDS

Jerald J. Hinkel, Broken Arrow, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 189,454, Sep. 22, 1980, abandoned, which is a continuation of Ser. No. 919,336, Jun. 26, 1978, Pat. No. 4,250,044. This application Apr. 12, 1984, Ser. No. 599,299

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.⁴ E21B *43/26*

U.S. Cl. 252—8.55 R **26 Claims**

1. A method of treating a subterranean formation penetrated by a borehole, wherein the static temperature of the borehole adjacent said formation is within the range of from about 50° F. to about 125° F., comprising: injecting into the borehole and into contact with the formation, a water-based fluid, of from between about 7 to about 12 pH and comprising

(a) an aqueous liquid,

(b) as a thickening agent to increase the viscosity of the aqueous liquid, a viscosity increasing amount of a polysaccharide which is soluble or dispersible in the aqueous liquid, and

(c) as a breaker to reduce the viscosity of the fluid after said fluid has contacted the formation and after its intended purpose as a viscous fluid has been served, the combination comprising an effective amount of (i) at least a partially water soluble tertiary amine of a pK_b of from about 3 to about 9, and (ii) at least one compound selected from the group consisting of ammonium persulfates and alkali metal persulfates in at least partially water soluble form.

4,560,487
BLENDS OF FLUOROCHEMICALS AND FIBROUS SUBSTRATES TREATED THEREWITH

Robert W. Brinkley, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 451,497, Dec. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 440,325, Nov. 9, 1982, abandoned. This application Aug. 15, 1984, Ser. No. 640,958

Int. Cl.⁴ D06M *13/08*

U.S. Cl. 252—8.75 **17 Claims**

1. A composition comprising a blend of: (a) a normally solid, water-insoluble, fluorochemical composition which is a fluoroaliphatic radical-containing compound, or composition comprising a mixture of such compounds, said compound having one or more monovalent fluoroaliphatic radicals, having at least three fully fluorinated carbon atoms, and one or more polar moieties selected from carbodiimido, carbonylimino, ester moieties, and combinations thereof, said radicals and moieties being bonded together by linking groups selected from aliphatic, aromatic, oxy, thio, carbonyl, sulfone, sulfoxy, $—N(CH_3)—$, sulfonamido, carbonamido, sulfonamidoalkylene, carbonamidoalkylene, carbonyloxy, urethane, urea, and combinations thereof; and (b) a normally

liquid or low melting solid, water soluble or dispersible, fluoroaliphatic radical-containing poly(oxyalkylene), or composition comprising a mixture of such poly(oxyalkylenes), said poly(oxyalkylene) having one or more of said fluoroaliphatic radicals and one or more poly(oxyalkylene) moieties, said radicals and poly(oxyalkylene) moieties bonded together by linking groups selected from aliphatic, aromatic, oxy, thio, carbonyl, sulfone, sulfoxy, phosphoxy, amine, oxyalkylene, iminoalkylene, iminoarylene, sulfoamido, carbonamido, sulfonamidoalkylene. carbonamidoalkylene, urethane, urea, ester, and combinations thereof.

4,560,488

METAL WORKING USING LUBRICANTS CONTAINING BASIC ALKALI METAL SALTS

James N. Vinci, Mayfield Heights, Ohio, assignor to The Lubrizoi Corporation, Ohio

Continuation of Ser. No. 304,526, Sep. 21, 1981, Pat. No. 4,505,830. This application Feb. 7, 1985, Ser. No. 699,106

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[4] C10M *1/38*

U.S. Cl. 252—33 **17 Claims**

1. A method for lubricating metal during working thereof which comprises applying to said metal a water-free composition comprising (A) a major amount of a lubricating oil; (B) a minor amount of a basic alkali metal salt of at least one sulfonic carboxylic and organic phosphoric acids and phenols or a borated complex of said basic alkali metal salt; and (C) a minor amount of at least one sulfurization product of an aliphatic, arylaliphatic or alicyclic olefinic hydrocarbon containing from about 3 to about 30 carbon atoms, said sulfurization product containing active sulfur.

4,560,489

HIGH PERFORMANCE CALCIUM BORATE MODIFIED OVERBASED CALCIUM SULFONATE COMPLEX GREASES

Ron Muir, West Hill, and William Blokhuis, Scarborough, both of Canada, assignors to Witco Chemical Corporation, New York, N.Y.

Filed Sep. 14, 1983, Ser. No. 531,841

Int. Cl.[4] C10M *1/40*

U.S. Cl. 252—33.4 **20 Claims**

1. A process of preparing high performance modified overbased calcium sulfonate complex greases, the steps which comprise introducing into or forming in situ, in a non-voltaile oleaginous medium comprising (a) non-Newtonian thickened overbased calcium sulfonate composition having a metal ratio of about 6 to about 30 and containing solid particles of colloidally dispersed crystalline calcite, (b) a product formed from the reaction of a boron acid with a calcium salt to form a calcium borate, (c) a soap formed from the reaction of a calcium compound and a soap-forming aliphatic monocarboxylic acid containing at least 12 carbon atoms, said (a) ingredient constituting from about 30 to about 55%, the boron acid and the calcium salt which together produce said calcium borate being present in proportions to produce from about 1.1 to about 6.7% of a calcium borate, and any calcium hydroxide which may be added to the aliphatic monocarboxylic acid being such as to produce a minor percentage of said soap not less than 1%, the said aliphatic monocarboxylic used in making said (c) soap being a minor percentage not less than 1%, and the balance of said complex greases being substantially a non-volatile oleaginous medium, the aforesaid percentages being by weight of said complex greases.

4,560,490

DISPERSING ADDITIVE COMPOSITIONS FOR LUBRICATING OILS AND THEIR MANUFACTURE

Jacques Denis, Charbonniere Les Bains; Michel Senneron, Meylan, and Bernard Sillion, Rocquencourt, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 3, 1984, Ser. No. 576,651

Claims priority, application France, Feb. 4, 1983, 83 01918

Int. Cl.[4] C10M *1/32, 1/20*

U.S. Cl. 252—51.5 A **18 Claims**

1. An additive composition having a dispersing effect in lubricating oils obtained by simultaneously reacting at least one alkenyl or polyalkenyl succinic anhydride containing 5 to 250 carbon atoms with at least one alkylphenol and with hexamethylenetetramine, wherein the molar ratio of said anhydride to alkylphenol is about 1:1 to 2:1, and the molar ratio of hexamethylenetetramine (expressed as amine groups) to anhydride is about 1.2:1 to 2:1.

4,560,491

SOFT CONTACT LENS WETTING SOLUTION AND IN-EYE COMFORT SOLUTION CONTAINING PRESERVATIVE AND METHOD

Guy J. Sherman, Mandeville, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Continuation-in-part of Ser. No. 537,245, Sep. 28, 1983, Pat. No. 4,529,535, which is a continuation-in-part of Ser. No. 384,110, Jun. 1, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 641,996

Int. Cl.[4] C11D *3/48*

U.S. Cl. 252—106 **19 Claims**

1. A sterile, aqueous contact lens wetting composition comprising:

(a) trimethoprim and an adjuvant bactericide comprising benzyl alcohol, present together in an amount for maintaining the sterility of the composition; and

(b) at least one wetting agent suitable for wetting contact lenses.

4,560,492

LAUNDRY DETERGENT COMPOSITION WITH ENHANCED STAIN REMOVAL

John D. Curry, Oxford, and James B. Edwards, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 2, 1984, Ser. No. 667,783

Int. Cl.[4] C11D *9/30*

U.S. Cl. 252—110 **10 Claims**

1. An aqueous liquid laundry detergent composition essentially free of inorganic phosphate salts comprising:

(a) from about 10% to about 65% by weight of a detergent surfactant selected from the group consisting of non-soap anionic surfactants, nonionic surfactants, zwitterionic surfactants, ampholytic surfactants, cationic surfactants and mixtures thereof;

(b) from about 8% to about 18% by weight of a detergency builder selected from the group consisting of C_{10-18} monocarboxylic acids, alkali metal, ammonium or substituted ammonium salts thereof, and mixtures thereof; and

(c) from about 0.5% to about 10% by weight hydroxyethylethylenediaminetriacetic acid, or alkali metal, alkaline earth, ammonium or substituted ammonium salts thereof or mixtures thereof, said composition being essentially free of inorganic detergency builders and providing a solution pH of from about 6 to about 8.5 at a 1% concentration in water.

4,560,493

LIQUID RESIDUE REDUCING PREPARATIONS CONTAINING OCTANE-1-PHOSPHONIC ACID OR A WATER-SOLUBLE SALT THEREOF

Rolf Scharf, Monheim; Ferdinand Koch, Hilden, and Hans-Joachim Schlüssler, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 506,596, Jun. 22, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 685,215

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240687

Int. Cl.⁴ C11D *3/06*

U.S. Cl. 252—174.16 **8 Claims**

1. A method of reducing the liquid residue remaining on a metal surface treated with aqueous solutions or rinsed with water which consists of contacting said surface having a liquid residue with an aqueous solution containing from about 20 to 1000 mg/liter of octane-1-phosphonic acid or a water-soluble salt thereof.

4,560,494

ISOCYANATE FUNCTIONAL PREPOLYMERS AND COATING MATERIALS BASED THEREON

Thomas W. Druetzler, Lynwood, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 27, 1984, Ser. No. 686,943

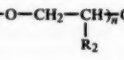
Int. Cl.⁴ C08G *18/30, 18/75, 18/79*

U.S. Cl. 252—182 **8 Claims**

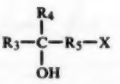
1. An isocyanate functional urethane which comprises the reaction product of:

(a) an aliphatic polyisocyanate having an average of at least 2.1 isocyanate groups per molecule and selected from the group consisting of the biurets and isocyanurates of linear aliphatic diisocyanates; and

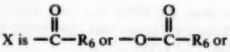
(b) at least one monofunctional alcohol having a molecular weight less than about 500 and which is selected from the group consisting of:



and

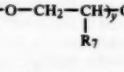


wherein n is from 1 to about 10; R_1 is an aliphatic radical of 1 to about 12 carbons; R_2 is H or CH_3; R_3 and R_4 are independently aliphatic of 1 to about 12 carbons or H; R_5 is an aliphatic radical of 1 to about 8 carbons or nothing;



where R_6 is an aliphatic radical of 1 to about 12 carbons; and

(c) at least one diol having the formula:



wherein R_7 is H or CH_3 and y is from 1 to about 40; wherein the total NCO/OH equivalents ratio is greater than 1.0 and the ratio of OH equivalents from (b) to OH equivalents from (c) ranges from 0.3:1 to 2.0:1.0.

4,560,495

DIACYL PEROXIDE COMPOSITION

Kenji Kato, Kariya, Japan, assignor to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1984, Ser. No. 636,202

Claims priority, application Japan, Aug. 5, 1983, 58-142593; Oct. 31, 1983, 58-202705

Int. Cl.⁴ C11D *3/39;* **C08K** *5/14;* **B01J** *31/02*

U.S. Cl. 252—186.23 **2 Claims**

1. A liquid, diacyl peroxide composition, which comprises

(a) from 10 to 60 parts by weight of diacyl peroxide component, said diacyl peroxide component comprising

(i) from 1 to 40% by weight of benzoyl peroxide (BPO),

(ii) from 5 to 79% by weight of a second peroxide selected from the group consisting of di-o-toluoyl peroxide (OTPO), di-m-toluoyl peroxide (MTPO), m-toluoyl-o-toluoyl peroxide (MOTPO) and a mixture thereof, and

(iii) from 20 to 55% by weight of a third peroxide selected from the group consisting of benzoyl-m-toluoyl peroxide (BMTPO), benzoyl-o-toluoyl peroxide (BOTPO) and a mixture thereof

wherein the foregoing percentages are based on 100% by weight of the sum of BPO, MTPO, OTPO, MOTPO, BMTPO, and BOTPO, and

(b) from 40 to 90 parts by weight of solvent in which said peroxides of (a) are dissolved, so that said liquid diacyl peroxide composition can be stored at a temperature below 5° C. without depositing solids or undergoing phase separation, wherein said solvent is one or more selected from the group consisting of aromatic hydrocarbons, halogenated hydrocarbons, ethers, ketones and esters.

2. A diacyl peroxide composition as claimed in claim 1 in which said composition consists essentially of from 20 to 50 parts by weight of (a) and from 50 to 80 parts by weight of (b).

4,560,496

LIQUID CRYSTALLINE NEMATIC COMPOUNDS

Demus Dietrich, Veilchenweg 22; Zaschke Horst, Platz d. Völkerfreundschaft 3; Altmann Heinz, Adolfstr. 3, all of 4020 Halle, and Keil Michael, Nr. 32, 6521 Etzdorf, all of German Democratic Rep.

Filed Sep. 26, 1984, Ser. No. 654,814

Claims priority, application German Democratic Rep., Sep. 30, 1983, 255274

Int. Cl.⁴ G02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.61 **6 Claims**

1. A mixture consisting essentially of 5–40 mol-% of component B and the balance component A, component B consisting essentially of 5-n-propyl-2-(4-cyanophenyl)-1,3-dioxane and component A consisting essentially of 60–70 mol-% of 4-n-butylcyclohexanecarboxylic acid and 30–40 mol-% of 4-n-hexylcyclohexanecarboxylic acid.

4,560,497

AMINO ESTER AND AMINO AMIDE-ESTER CORROSION INHIBITORS FOR AQUEOUS SYSTEMS

Donald D. Staker, and William S. Kain, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,238

Int. Cl.⁴ C23F *11/00*

U.S. Cl. 252—392 **11 Claims**

1. A water-soluble or water-dispersible corrosion inhibitor composition obtained by reacting

(a) a maleinized polymeric fatty acid,

(b) a poly(oxyalkylene)glycol having an average molecular weight from about 200 to 8000 or alkoxypoly(oxyalkylene)glycol having an average molecular weight from 200 to 2000, wherein the recurring oxyalkylene groups contain 2 or 3 carbon atoms, and

(c) a nitrogen containing compound selected from the group consisting of

$A_1—R_1—NR'R'$

wherein R_1 is a bivalent hydrocarbon radical having from 2 to 6 carbon atoms, R' is hydrogen or a C_{1-4} alkyl group, and A_1 is —OH, $—NH_2$ or —NHR' wherein R' is the same as defined above;

$$A_2—R_2—\underset{\displaystyle R_3}{N}—R_2—A_2$$

wherein R_2 is a bivalent hydrocarbon radical having from 2 to 4 carbon atoms, R_3 is hydrogen, C_{1-4} alkyl, $—R_2OH$ or $—R_2NH_2$ wherein R_2 is the same as defined above and A_2 is —OH or $—NH_2$; and

$A_3(—R_4O)_xR_4NH_2$

wherein R_4 is $—CH_2CH_2—$, $—CH_2CH_2CH_2—$, or

$$—CH_2\underset{\displaystyle CH_3}{CH}—,$$

x is an integer from 1 up to about 40 and A_3 is —OH, $—NH_2$ or an alkoxy radical having from 1 to 12 carbon atoms;

at least 50 percent of the total available carboxyl groups of said maleinized polymeric fatty acid being reacted.

4,560,498

POSITIVE TEMPERATURE COEFFICIENT OF RESISTANCE COMPOSITIONS

David A. Horsma, Palo Alto, and Teddy J. Hammack, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 601,639, Aug. 4, 1975, which is a continuation of Ser. No. 510,035, Sep. 27, 1974. This application Oct. 12, 1979, Ser. No. 84,352

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 **20 Claims**

1. An electrically conductive crosslinked polymeric composition which (a) is suitable for use in a self-regulating heating article comprising at least two electrodes positioned so that that, when the electrodes are connected to a power source, current passes through the composition, (b) has a positive temperature coefficient of resistance and (c) comprises (1) a first polymeric material which prior to cross-linking exhibits significant green strength corresponding to a tensile stress of at least 10 p.s.i. at 20% elongation and which exhibits elastomeric properties at ambient temperatures in the crosslinked state (2) a second thermoplastic polymeric material, and (3) conductive particles which have been dispersed in said polymeric material such that the composition exhibits increased resistance with increased temperatures at temperatures substantially above the melting point of either material.

4,560,499

ISOSOLANONE AND SOLANONE INTERMEDIATES AND ORGANOLEPTIC USES

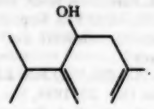
John B. Hall, Rumson; James M. Sanders, Eatontown, and James N. Siano, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 542,477, Oct. 17, 1983, Pat. No. 4,476,147, which is a division of Ser. No. 380,542, May 20, 1982, Pat. No. 4,433,695. This application Jun. 22, 1984, Ser. No. 609,349

Int. Cl.[4] C11B *9/00*

U.S. Cl. 252—522 R **8 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising to the step of adding to said consumable material, an aroma augmenting or enhancing quantity of the compound having the structure:



4,560,500

NORBORNYLBUTADIENE-ACROLEIN ADDUCTS, PROCESS FOR PREPARING SAME AND PERFUMERY USES THEREOF

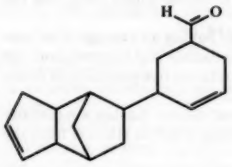
Wilhelmus J. Wiegers, Red Bank, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 24, 1984, Ser. No. 613,568

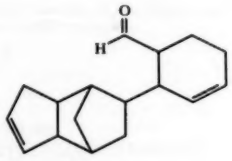
Int. Cl.[4] C11B *9/00*; A61K *7/46*

U.S. Cl. 252—522 R **4 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an aroma augmenting or enhancing quantity of a mixture of norbornylbutadiene-acrolein adducts defined according to the structures:



and



4,560,501

APPARATUS FOR MANUFACTURING SOLIDIFIED RADIOACTIVE WASTE

Yuji Minami, Kawasaki; Hisashi Kamiyama, Yokosuka, and Toshihide Tomita, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 206,531, Nov. 13, 1980, abandoned. This application Aug. 22, 1983, Ser. No. 525,432

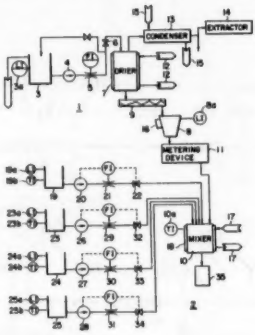
Claims priority, application Japan, Nov. 29, 1979, 54-153623

Int. Cl.[4] G21F *9/14*

U.S. Cl. 252—628 **1 Claim**

1. In an apparatus for manufacturing solidified radioactive waste of the type comprising a first system including a drier for producing radioactive waste powder from liquid radioactive waste and a second system includng a mixer for mixing said radioactive waste powder with a thermosetting resin and additives and tanks connected to said mixer for storing said thermosetting resin and said additives, the improvement comprising a radioactive waste powder storage tank connected between said drier and said mixer for storing said radioactive waste powder, a metering device connected between said powder storage tank and said mixer for supplying a predetermined amount of said radioactive waste powder to said mixer, cooling

means attached to said mixer for cooling said mixer, said cooling means being designed and sized to maintain the mixture in said mixer at a temperature of about −20° C. so as to delya setting of those portions of the mixture adhering to the inside



wall of said mixer, so that the portions of the mixture adhering to the inside wall may be mixed with a subsequent batch of mixture and said mixture adhering to the inside wall does not have to be cleaned from said mixer, and a container for receiving the mixture from said mixer.

4,560,502

MOLDED BODY FOR EMBEDDING RADIOACTIVE WASTE AND PROCESS FOR ITS PRODUCTION

Karl Hackstein, Hanau; Milan Hrovat, Rodenbach; Thomas Schmidt-Hansberg, Frankfurt; Lothar Rachor, and Hans Hüschka, both of Hanau, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,344

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144764

Int. Cl.⁴ G21F *9/16*

U.S. Cl. 252—628 **14 Claims**

1. Radioactive or toxic waste embedded in a molded body of graphite having nickel sulfide as a binder for the safe longtime storage of the waste wherein more than 50% of the nickel sulfide and up to 100% of the nickel sulfide is present as Ni_3S_2 the nickel sulfide being preponderantly present as Ni_3S_2.

4,560,503

FLUID WASTE DISPOSAL

John S. Bradley, Tulsa, Okla., assignor to John D. Gassett, Tulsa, Okla., a part interest

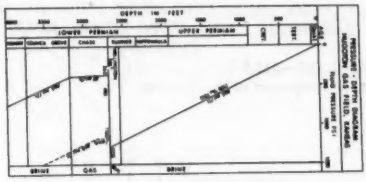
Filed Aug. 30, 1982, Ser. No. 412,887

Int. Cl.⁴ G21F *9/24*

U.S. Cl. 252—633 **4 Claims**

1. A method of disposing of fluid industrial waste which comprises:

locating a porous, permeable, sub-surface stratum which, before any fluid has been removed therefrom, has fluid pressure in the pores thereof which is less than normal hydrostatic pressure for that depth of said stratum in that area;



flowing industrial fluid into said stratum at a rate so that said fluid pressure never exceeds said normal hydrostatic pressure.

4,560,504

CARBOXYL ANCHORED IMMOBILIZED ANTIBODIES

Edward C. Arnold, Naperville, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 6, 1984, Ser. No. 678,953

Int. Cl.⁴ A61K *39/44*; C07G *7/00, 7/04*

U.S. Cl. 260—112 B **17 Claims**

1. An immobilized antibody system comprising an aminated core support, selected from the group consisting of porous or semi-porous inorganic solids containing amino groups and amino-functionalized polyhydroxylic organic materials, and an antibody or antibody fragment covalently bonded to the support by an amide linkage resulting from the reaction of an amino group of the core support with a carboxylic acid group of the antibody.

4,560,505

RETRO-INVERSO ANALOG OF THE (5–14) DECAPEPTIDE OF EQUINE ANGIOTENSINOGEN, AS A SPECIFIC RENIN INHIBITOR WITH HIGH RESISTANCE TO ENZYMATIC HYDROLYSIS

Massimo Pinori, and Antonio S. Verdini, both of Monterotondo, Italy, assignors to ENI - Ente Nazionale Idrocarburi, Rome, Italy

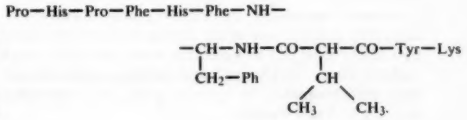
Filed May 22, 1984, Ser. No. 612,798

Claims priority, application Italy, May 25, 1983, 21281 A/83

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 R **3 Claims**

1. A peptide partially retro-inverted at the Phe—Val bond, as a specific renin inhibitor and possessing high resistance to enzymatic hydrolysis and prolonged in vivo inhibition activity, of the following formula:



4,560,506

MERCAPTOCYCLOALKYLCARBONYL AND MERCAPTOARYLCARBONYL DIPEPTIDES

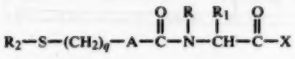
Harold N. Weller, III; Eric M. Gordon, both of Pennington, and Norma G. Delaney, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 25, 1984, Ser. No. 614,090

Int. Cl.[4] C07C 103/52; C07D 207/00, 277/04, 209/44, 211/06, 213/22, 241/36, 209/02, 277/60, 231/06, , 403/30, 499/00; C07G 7/00

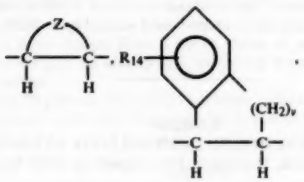
U.S. Cl. 260—112.5 R 24 Claims

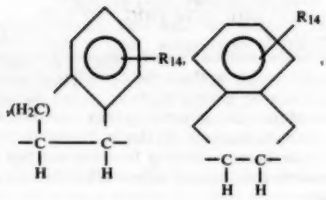
1. A compound of the formula

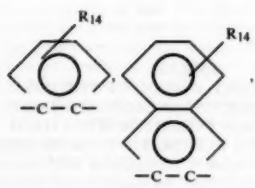


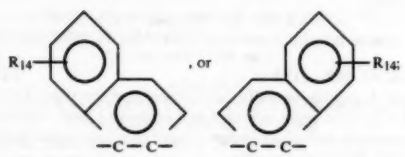
or a pharmaceutically acceptable salt thereof wherein:

A is





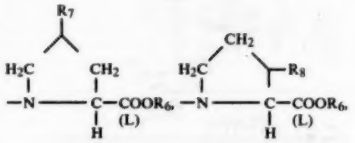


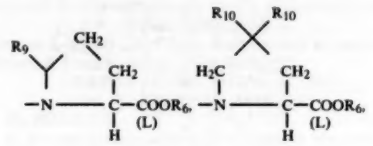


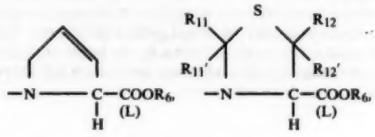
v is one or two;

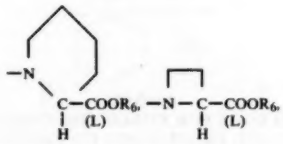
Z completes a cycloalkyl ring of 3 to 10 carbons; said cycloalkyl ring in which one of the carbon atoms is substituted by a lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, phenyl, benzyl, halo, trifluoromethyl, or hydroxy group; or a cycloalkenyl ring of 5 to 7 carbons;

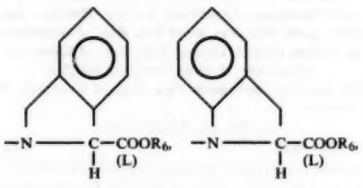
X is an amino or imino acid of the formula

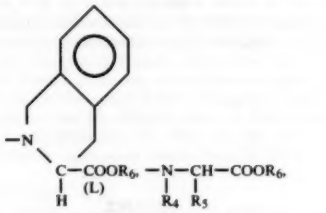


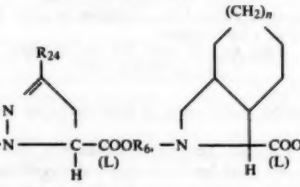












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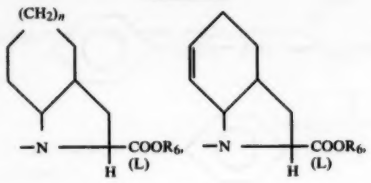
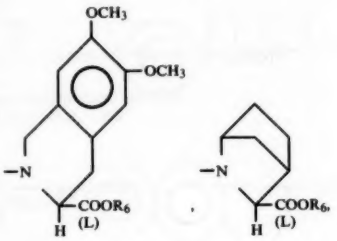
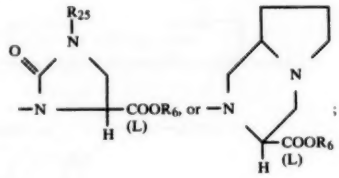
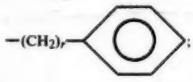




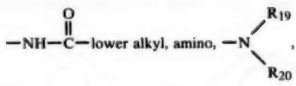


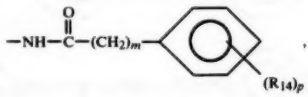
n is zero, one, or two;
R_{25} is lower alkyl of 1 to 4 carbons

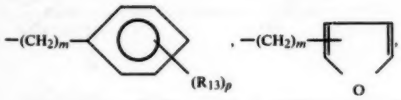


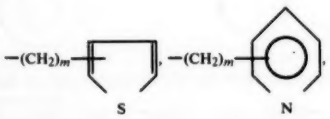
R_7 is hydrogen, lower alkyl, halogen,

hydrogen, lower alkyl, halogen, hydroxy,









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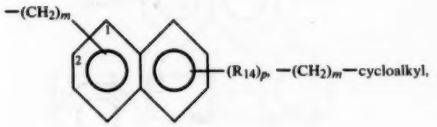
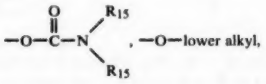
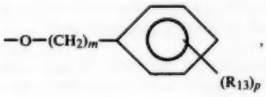
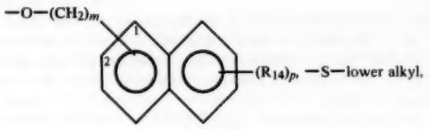
a 1- or 2-naphthyl of the formula

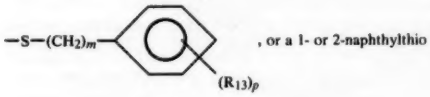




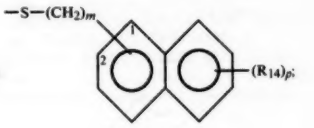


a 1- or 2-naphthyloxy of the formula

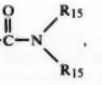


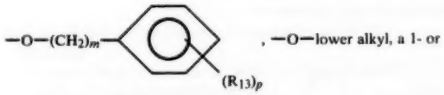


of the formula

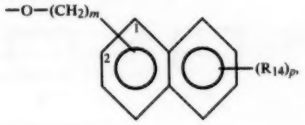


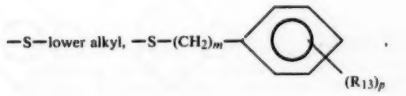
R_8 is halogen,





2-naphthyloxy of the formula





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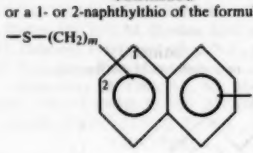
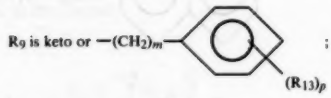
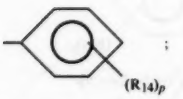
or a 1- or 2-naphthylthio of the formula





R_{10} is halogen or —Y—R_{16}; selected from hydrogen and lower alkyl or R'_{11}, R_{12} and R'_{12} are hydrogen and R_{11} is



R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

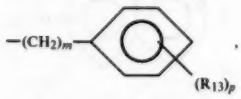
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

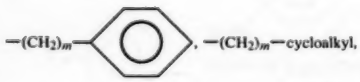
Y is oxygen or sulfur;

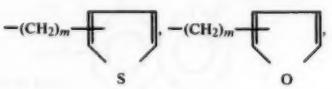
R_{16} is lower alkyl of 1 to 4 carbons,

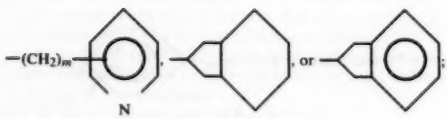


or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

R_4 is hydrogen, lower alkyl,







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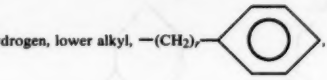
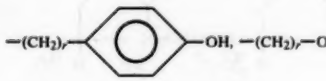
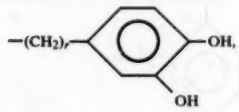
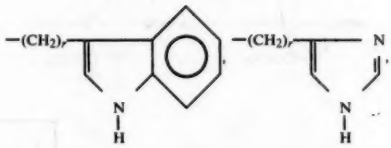
R_5 is hydrogen, lower alkyl, —$(CH_2)_r$—

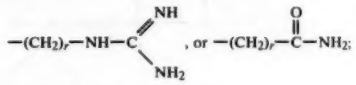








—$(CH_2)_r$—NH_2, —$(CH_2)_r$—SH, —$(CH_2)_r$—S—lower alkyl,

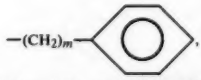


r is an integer from 1 to 4;

R_{19} is lower alkyl, benzyl, or phenethyl;

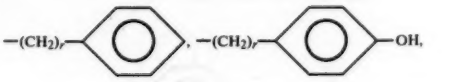
R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

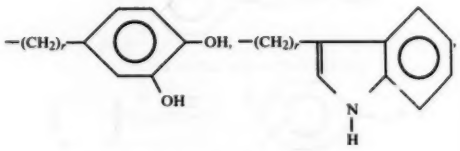
R is hydrogen, lower alkyl, cycloalkyl,

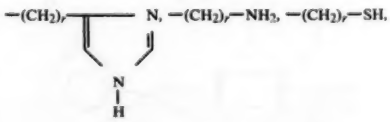


—$(CH_2)_2$—NH_2, —$(CH_2)_3$—NH_2, —$(CH_2)_4$—NH_2, —$(CH_2)_2$—OH, —$(CH_2)_3$—OH, —$(CH_2)_4$—OH, —$(CH_2)_2$—SH, —$(CH_2)_3$—SH, or —$(CH_2)_4$—SH;

R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,







—$(CH_2)_r$—OH, —$(CH_2)_r$—S—lower alkyl,

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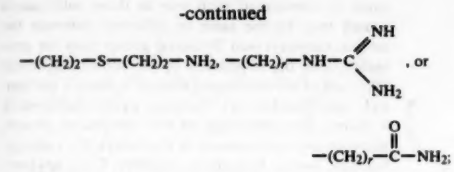
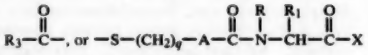
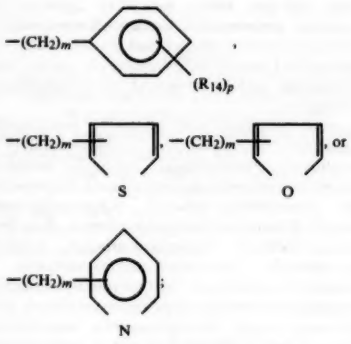


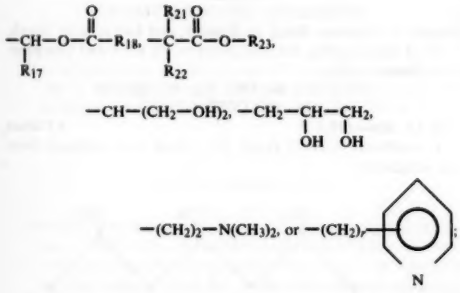
R_2 is hydrogen,



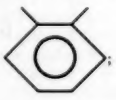
to form a symmetrical disulfide;
R_3 is lower alkyl,



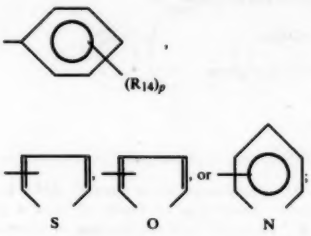
R_6 is hydrogen, lower alkyl, benzyl, benzhydryl, a pharmaceutically acceptable salt ion,



R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;
R_{18} is hydrogen, lower alkyl, lower alkoxy, or phenyl or R_{17} and R_{18} is taken together are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$, or



R_{21} and R_{22} are independently selected from hydrogen and lower alkyl;
R_{23} is lower alkyl;
R_{24} is hydrogen, lower alkyl,



and q is zero or one.

4,560,507

PREPARATION OF 1-BENZYLAZETIDIN-3-OL

Alexander F. Orr, Kent, England, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 27, 1984, Ser. No. 604,696

Claims priority, application United Kingdom, May 4, 1983, 8312104

Int. Cl.[4] C07D *205/04*

U.S. Cl. 260—239 A **3 Claims**

1. A process for preparing 1-benzylazetidin-3-ol, which comprises heating N-benzyl-3-amino-1-chloropropan-2-ol in an aqueous medium selected from water and mixtures of water and inert organic liquids.

4,560,508

4-CYANO-2-AZETIDINONES AND PRODUCTION THEREOF

Taisuke Matsuo, deceased, late of Osaka (by Michiko Matsuo, Takeshi Matsuo, Tazuko Matsuo, heirs); Michihiko Ochiai, Osaka, and Shoji Kishimoto, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

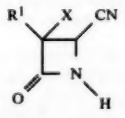
Filed Dec. 20, 1982, Ser. No. 451,323

Claims priority, application Japan, Dec. 25, 1981, 56-212718; PCT Int'l Appl., Apr. 27, 1982, PCT/JP8200141

Int. Cl.[4] C07D *205/08, 403/12, 401/12;* **A61K** *31/395*

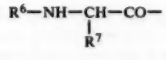
U.S. Cl. 260—239 A **9 Claims**

1. A 4-cyano-2-azetidinone compound of the formula



wherein X is hydrogen atom or methoxy; and R^1 is
(1) amino,
(2) an acylated amino group wherein the acyl moiety is
(A) a group of the formula:

wherein R^5 is lower alkyl other than C_{1-5} alkyl-CH_2—, phenyl* or heterocyclic* group;
(B) a group of the formula:



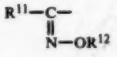
wherein R^6 is hydrogen, amino acid residue*, amino-protecting group or a group R^8—$(CH_2)_m$—CO— wherein R^8 is heterocyclic*, phenyl* or lower alkyl*; m

is an integer of 0 to 3; R_7 is hydrogen, lower alkyl*, phenyl*, heterocyclic* or cycloalkenyl*;

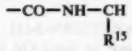
(C) a group of the formula:

$$R^9—R^{10}—CO—$$

wherein R^9 is a group

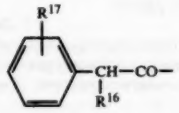


wherein R^{11} is heterocyclic* or phenyl*; R^{12} is hydrogen, phenyl*, lower acyl or lower alkyl or a group $—R^{13}—R^{14}$ where R^{13} is lower alkylene or lower alkenylene and R^{14} is carboxyl or esterified carboxyl; R^{10} is a direct bond or a group



wherein R^{15} is lower alkyl or heterocyclic*;

(D) a group of the formula:



wherein R^{16} is halogen, hydroxy, carboxyl, sulfo, formyloxy or azido; R_{17} is hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy; or

(E) a group of the formula:

$$R^{18}—R^{19}—CH_2—CO—$$

wherein R^{18} is cyano, phenyl*, phenoxy*, lower alkyl*, alkenyl* or heterocyclic*; R^{19} is a direct bond or —S—; and, in the symbols R^5 through R^{19},

(a) the lower alkyl is a C_{1-6} alkyl,

(b) the lower alkoxy is a C_{1-6} alkoxy,

(c) the alkenyl group contains 2–4 carbon atoms,

(d) the cycloalkenyl is of 5- or 6-carbon atoms,

(e) the lower alkylene contains 1–3 carbon atoms,

(f) the lower alkenylene contains up to 3 carbon atoms,

(g) the halogen atom is chlorine, bromine, iodine or fluorine,

(h) the heterocyclic group is 2- or 3-pyrrolyl, 2- or 3-furyl, 2- or 3-thienyl, 2- or 3-pyrrolidinyl, 2-, 3- or 4-pyridyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 3- or 4-piperidinyl, 2-, 3- or 4-pyranyl, 2-, 3- or 4-thiopyranyl, pyrazinyl, 2-, 4- or 5-thiazolyl, 2-, 4- or 5-oxazolyl, 3-, 4- or 5-isothiazolyl, 3-, 4- or 5-isoxazolyl, 2-, 4- or 5-imidazolyl, imidazolidinyl, 3-, 4- or 5-pyrazolyl, pyrazolidinyl, 3- or 4-pyridazinyl, N-oxido-3- or 4-pyridazinyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, piperazinyl, 4- or 5-(1,2,3-thiadiazolyl), 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl), 4- or 5-(1,2,3-oxadiazolyl), 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,2,3- or 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, pyrido(2,3-d)pyrimidyl, benzopyranyl, 1,8-, 1,5-, 1,6-, 1,7-, 2,7- or 2,6-naphthyridyl, quinolyl or thieno(2,3-b)pyridyl,

(i) the amino acid residue is glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl, α-, or β-aspartyl, α- or β-glutamyl, lysyl, arginyl, phenylalanyl, phenylglycyl, tyrosyl, histidyl or tryptophyl,

(j) the lower acyl group contains 2–4 carbon atoms,

(k) the group with a superscript asterisk "*" is unsubstituted or substituted with one to three substituents which may be the same or different, wherein the amino, carboxyl and hydroxy group may be protected, thus the substituent of the substituted lower alkyl and of the substituted alkenyl is phenyl, carbamoyl, methylcarbamoyl, carboxy, cyano, halogen or hydroxy, the substituent of the substituted phenyl, phenoxy and cycloalkenyl is C_{1-3} alkyl, C_{1-3} alkoxy, halogen, amino, benzyloxy, hydroxy, C_{2-10} acyloxy, aminomethyl, carbamoylaminomethyl or 3-amino-3-carboxypropoxy, the substituent of the substituted heterocyclic group is C_{1-8} alkyl, C_{1-3} alkoxy, hydroxy, carboxyl, oxo, monochloroacetamido, aldehyde, trifluoromethyl, amino, halogen, coumarin-3-carbonyl, 4-formyl-1-piperazinyl, pyrrolealdimino, furanaldimino, thiophenealdimino, mesyl, mesylamino-, amino-protecting group, halo-substituted C_{2-4} acylamino, phenyl or phenyl substituted with one to three substituents selected from C_{1-3} alkyl, C_{1-3} alkoxy, halogen, amino, benzyloxy, hydroxy, C_{2-10} acyloxy, aminomethyl, carbamoylaminomethyl and 3-amino-3-carboxypropyl, and the substituent of the substituted amino acid residue is amino, amino-protecting group, carbamoyl, methylcarbamoyl or benzyl, or

(3) an amino protected with phthaloyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, methanesulfonyl, ethanesulfonyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

or an acid-addition salt thereof.

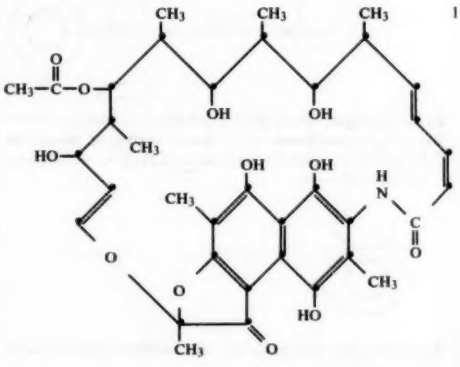
4,560,509

ANTIBIOTIC A39079 FACTOR S-1

Ronald D. Johnson; Ralph E. Kastner, and LaVerne D. Boeck, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

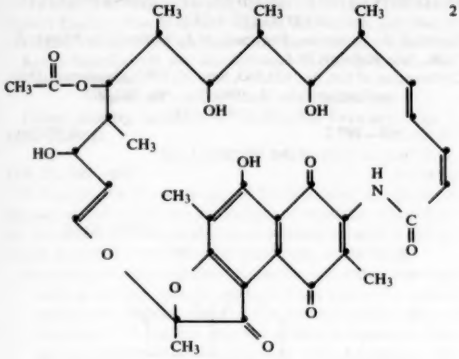
Filed Nov. 16, 1983, Ser. No. 552,549
Int. Cl.⁴ C07D *491/08*
U.S. Cl. 260—239.3 P **5 Claims**

1. Antibiotic A39079 factor S-1 which in its reduced form has structure 1:



1

and which in its oxidized form has structure 2



2

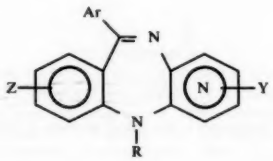
4,560,510

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF ARYL SUBSTITUTED PYRIDO[1,4]BENZODIAZEPINES

Young S. Lo, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

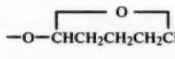
Filed Apr. 6, 1984, Ser. No. 597,413
Int. Cl.[4] C07D *471/04*
U.S. Cl. 260—244.4 **13 Claims**

1. A process for the preparation of a pyridobenzodiazepine compound having the formula:



wherein;

R is selected from the group consisting of alkali-metal cation (M^+), hydrogen, —alk[1]—Q wherein Q is selected from hydrogen, halo, —NR^1R^2, —N=CH—OC_2H_5 or



R^1 and R^2 are selected from the group consisting of loweralkyl, —C(O)—O—loweralkyl or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-piperidinyl, 1-phthalimido, 1-pyrrolidinyl, 4-morpholinyl, 1-piperazinyl and 4-substituted-piperazin-1-yl;

Ar is selected from the group consisting of 2, 3 and 4-pyridinyl, 2 or 3-thienyl, phenyl or phenyl substituted by 1 to 3 adicals selected from halo, loweralkyl, loweralkoxy, trifluoromethyl or nitro and may be the same or different;

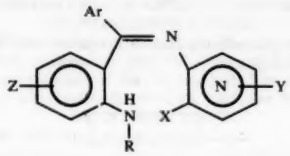
alk[1] is a straight or branched hydrocarbon chain containing 1–8 carbon atoms;

Z is selected from the group consisting of hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy or nitro;

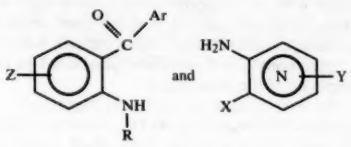
Y is selected from the group consisting of hydrogen or 1–2 radicals selected from loweralkyl, loweralkoxy or hydroxy and may be the same or different,

and the acid addition salts thereof except when R=M^+, which comprises the steps of:

Step 1, reacting a compound of the formula

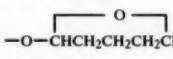


or a mixture of compounds of the formulas



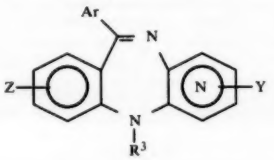
wherein Ar, Y and Z are as defined above and X is selected from chlorine, bromine, fluorine or iodine;

R is hydrogen or alk[1]—Q wherein alk[1] is as defined above and Q is hydrogen, —NR^1R^2, —N=CH—OC_2H_5 or



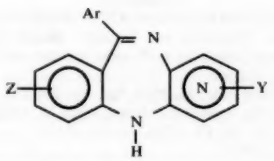
and

R^1 and R^2 are selected from loweralkyl, —C(O)O—loweralkyl, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-piperidinyl, 1-phthalimido, 1-pyrrolidinyl, 4-morpholinyl, 1-piperazinyl and 4-substituted-piperazin-1-yl, with at least a stoichiometric amount of a strong non-nucleophilic alkali-metal base in stirrable admixture with inert liquid carrier to give a compound of the formula



in said carrier, wherein Ar, Y and Z are as defined above, and R^3 is an alkali-metal ion consisting of sodium, potassium or lithium, or —alk[1]—Q wherein alk[1] is as defined above and Q is the same as in the starting compound;

Step 2, reacting a compound as prepared in said carrier in step 1 wherein R^3 is an alkali-metal ion with a proton source to give a compound of the formula:

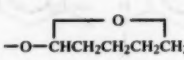


in said carrier, wherein Ar, Z and Y are as defined above.

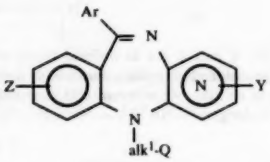
Step 3, reacting a compound as prepared in said carrier in step 1 wherein R^3 is an alkali-metal ion with a reagent having the formula:

halo—alk[1]—Q

wherein Q is selected from hydrogen, —NR[1]R[2], —N=CH—O—C_2H_5 or

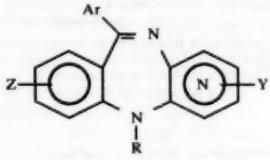


and R^1 and R^2 are as selected from the group consisting of loweralkyl, —C(O)—O—loweralkyl or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-piperidinyl, 1-phthalimido, 1-pyrrolidinyl, 4-morpholinyl, 1-piperazinyl and 4-substituted-piperazin-1-yl, to give a compound of the formula:



in said carrier, wherein Q has the starting value of said reagent and Ar, Y, Z and alk[1] are as defined above;

Step 4, separating a compound prepared in step 1, other than a compound wherein R^3 is an alkali-metal cation or a compound prepared in steps 2 or 3 by conventional means from said carrier and the reaction mixture to give a compound of the formula:



wherein Ar, Y, Z and R are as defined above, except R is not alkali-metal ion, and the acid addition salts thereof.

4,560,511

METHOD OF PRODUCING SHIKONIN

Akira Terada, Munakata, and Yasuhiro Tanoue, Kitakyushu, both of Japan, assignors to Kyushu Institute of Technology, Kitakyushu, Japan

Filed Mar. 26, 1984, Ser. No. 593,135
Claims priority, application Japan, Mar. 26, 1983, 58-50801
Int. Cl.[4] C07C *50/14, 50/12*
U.S. Cl. 260—396 R **2 Claims**

1. A method of producing shikonin, which comprises dehydrating 2-(1'-acetoxy-4'-hydroxy-4'-methylpentyl)-5,8-diacetoxy-1,4-naphthoquinone, with phosphorous pentoxide or thionylchloride treating the resulting product with an alkali hydroxide, and then acidifying the thus treated product.

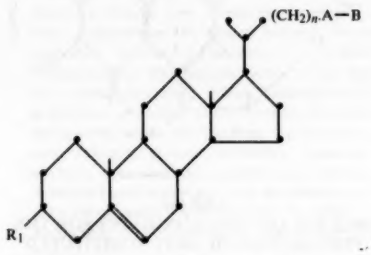
4,560,512

DERIVATIVES OF STEROID COMPOUNDS LINKED TO CYOTOXIC AGENTS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 431,943, Sep. 30, 1982, abandoned. This application Feb. 15, 1984, Ser. No. 580,507
Int. Cl.[4] C07J *7/00*
U.S. Cl. 260—397.2 **6 Claims**

1. A Steroid ester of the formula:



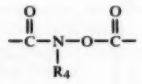
wherein

R_1 is an unsaturated aliphatic carbonyloxy radical of from 12–30 carbon atoms

n is an integer of from 1–3

A is a bivalent linking radical selected from

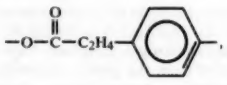
(a)



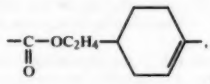
wherein R_4 is hydrogen lower alkyl, phenyl, or heteroaryl or

(b)

(c)



(d)



and

B is a monovalent radical of a cytotoxic substance linked through an amino nitrogen selected from bis-(2-chloroethyl)amine, uracil mustard, 6-mercaptopurine, thioquanine, adriamycin, procarbazine and mitomycin C.

4,560,513

PROCESS FOR THE RECOVERY OF LECITHIN

Hubert Coenen, Essen; Rudolf Eggers, Buxtehude, and Rainer Hagen, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,346

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229041

Int. Cl.[4] C07F 9/10

U.S. Cl. 260—403 8 Claims

1. Process for the recovery of lecithin from mucilaginous substances obtained in the production of vegetable fats and oils by extraction of the mucilaginous substances with a solvent which is gaseous under normal conditions, comprising:

extracting the mucilaginous substances in an extraction stage with a solvent at a pressure of from twice the critical pressure to 500 bar and at a temperature greater than or equal to 0° C. but less than the critical temperature for a period of from 15 to 60 minutes to form a charged, compressed solvent phase containing extracted substances and an extraction residue containing insoluble lecithin;

thereafter separating the charged, compressed solvent phase from the insoluble lecithin;

then separating the extracted substances from the charged, compressed solvent phase by the reduction of pressure or the reduction of pressure and increase of temperature;

returning the gaseous solvent to the extraction stage; and

removing the lecithin from the extraction stage and obtaining it in solid form by evaporating any solvent therefrom.

4,560,514

INFLAMMATORY LIPOXIN A AND ANTI-ANFLAMMATORY LIPOXIN B COMPOUNDS

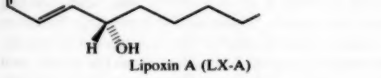
Bengt Samuelsson, Framnåsvagen 6, 18263 Djursholm, Sweden; Charles Serhan, 2972 Waverly Ave., Oceanside, N.Y. 11572, and Mats Hamberg, Antilopvägen 6, 18143 Lidingö , Sweden

Filed May 4, 1984, Ser. No. 607,350

Int. Cl.[4] C11C 1/00; C09F 5/08, 7/00

U.S. Cl. 260—410 3 Claims

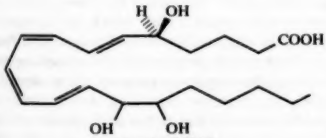
1. Lipoxin A, a compound of formula XXIII,



XXIII

Lipoxin A (LX-A)

or Lipoxin B, a compound of formula XXIV,



XXIV

Lipoxin (LX-B)

except as Lipoxin A or Lipoxin B exist or occur in nature, or a Lipoxin A or Lipoxin B derivative of the carboxy group of the lipoxin compound or one of the three hydroxyl groups of the lipoxin compound.

4,560,515

PREPARATION OF OPTICALLY-ACTIVE CYANOMETHYL ESTERS

Donald W. Stoutamire, and Charles H. Tieman, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 443,513, Nov. 22, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,652

Int. Cl.[4] C07C 121/75

U.S. Cl. 260—465 D 53 Claims

1. A process for the preparation of an optically-active cyanomethyl ester of an alpha-chiral carboxylic acid or a mixture enriched therein which comprises treating a non-symmetrical ketene with a racemic or an optically-active alpha-hydroxynitrile or with an aldehyde or ketone and cyanide ions in the presence of an optically-active tertiary amine catalyst.

4,560,516

PROCESS FOR THE PRODUCTION OF ETHYLENEDIAMINE TETRAACETONITRILE

John J. Singer, Hollis, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 526,230, Aug. 24, 1983, abandoned, which is a continuation of Ser. No. 333,138, Dec. 21, 1981, abandoned. This application Jan. 31, 1985, Ser. No. 696,782

Int. Cl.[4] C07C 120/00, 121/43

U.S. Cl. 260—465.5 A 7 Claims

1. In the formation of ethylenediamine tetraacetonitrile from ethylenediamine, formaldehyde and hydrocyanic acid, the process improvement which comprises

(1) allowing the adduct formed from ethylene diamine and two molar equivalent amounts of formaldehyde to react with about two molar equivalent amounts of hydrocyanic acid at a temperature no greater than about 30° C. and at an alkaline pH of from about 8 to 10 so as to form a solution of ethylenediamine diacetonitrile in the reaction mixture; and

(2) thereafter, as a discrete step, adding said ethylenediamine diacetonitrile solution to at least two molar equivalent amounts of hydrocyanic acid and at least two molar equivalent amounts of formaldehyde at an acidic pH at or below 1.0 so as to form said ethylenediamine tetraacetonitrile as a solid precipitate, said formation of ethylenediamine tetraacetonitrile being conducted below a temperature about 70° C. by the addition of an inert coolant or cooled mother liquor separated from precipitated ethylenediamine tetraacetonitrile to the reaction mixture.

4,560,517

SULFONATION OF CRUDE OILS WITH GASEOUS SO_3 TO PRODUCE PETROLEUM SULFONATES

Donald E. Schroeder, Jr.; Mark A. Plummer, and Carle C. Zimmerman, Jr., all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 22,668, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 430,963, Jan. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 238,084, Mar. 27, 1982, abandoned. This application Aug. 22, 1980, Ser. No. 180,250

Int. Cl.[4] C07C 139/00, 143/24

U.S. Cl. 260—505 R 32 Claims

1. A process for the preparation of petroleum sulfonate suitable for use with mixtures of hydrocarbon and water in secondary-type recovery of petroleum, comprising in combination contacting sulfur trioxide in the gas phase with a hydrocarbon selected from the group consisting of whole crude oil, topped crude oil and mixtures thereof in a reaction zone fed by a substantially continuous flow of said hydrocarbon, said hydrocarbon being contacted in said reaction zone with a substantially continuous flow of SO_3 vapor stream comprising sulfur trioxide vapor, sulfur dioxide vapor and light hydrocarbon vapor, the temperature in said reaction zone being main-

tained at about 120° to 250° F., the pressure in said reaction zone being maintained in the range of about 3 to about 50 psia, the reaction time being from about 0.005 to about 30 seconds; wherein each hundred pounds of hydrocarbon is contacted with about 3 to about 30 pounds of sulfur trioxide, with about 0.01 to about 10 moles of sulfur dioxide and with about 0.01 to about 10 moles of light hydrocarbon vapor; thereafter compressing the effluent from said reaction zone to a pressure of at least about 0.01 pounds per square inch higher than that prevailing in said reaction zone, thereafter separating a vapor stream and a liquid stream from said effluent in a vapor-liquid separating stage, recycling at least a portion of said vapor stream back to said reaction zone and recycling a portion of said liquid back to mix with said hydrocarbon being fed to said reaction zone, and removing the remaining portion of said liquid stream to a neutralization zone where it is reacted with a monovalent inorganic base to obtain the petroleum sulfonate which has an average equivalent weight of about 350 to about 525.

4,560,518

PROCESS FOR THE CONTINUOUS PRODUCTION OF 2-CARBOXYETHYL-ALKYL-PHOSPHINIC ACID DIALKYLESTERS

Klaus Gehrmann; Alexander Ohorodnik, both of Erftstadt, and Johannes Rosenthal, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

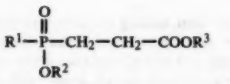
Filed Nov. 23, 1983, Ser. No. 554,593

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245364

Int. Cl.⁴ C07F *9/32*

U.S. Cl. 260—970 **8 Claims**

1. In the process for the continuous production of 2-carboxyethyl-alkyl-phosphinic acid dialkylesters of the following general formula I

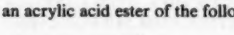


(I)

by reacting an alkanephosphonous acid monoalkylester of the following general formula II

(II)

with an acrylic acid ester of the following general formula III



(III)

in the presence of a metal alcoholate of the formula $(R^6O)_nMe$ and an alcohol of the formula R^7OH, in which formulae

R^1 stands for an alkyl group having 1 to 3 carbon atoms,

R^2 through R^7 each stand for an alkyl group having from 1 to 6 carbon atoms, and

Me stands for the metals

Li, Na, K where n is 1

Mg where n is 2 and

Al where n is 3

the improvement which comprises:

(a) introducing a quantity by volume (corresponding to reactor volume) of the 2-carboxyethyl-alkyl-phosphinic acid dialkylester (to be produced), as a solvent into a reactor adapted to circulate reaction mixture therein, closed in itself and provided with cooling means and an overflow, and circulating the mixture in the reactor;

(b) continuously introducing the alkanephosphonous acid monoalkylester, acrylic acid alkylester and an alcoholic solution of the metal alcoholate into the reactor while cooling the material circulated therein, and reacting the whole at a temperature of about 0° to 80° C. within a period of about 5 to 120 minutes, the alkanephosphonous acid monoalkylester and acrylic acid alkylester being used in a molar ratio of about 1:0.9–2, and the metal alcoholate being used in a proportion of about 0.1 to 5 mol %, based on the phosphonous acid monoalkylester; and

(c) continuously removing a mixture containing final product through the overflow of the reactor and distillatively separating 2-carboxyethyl-alkyl-phosphinic acid dialkylester from the mixture.

4,560,519

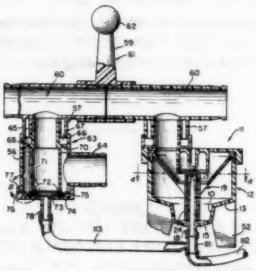
SELF-CONTAINED NEBULIZER AND SYSTEM

David E. Cerny, Hoffman Estates, Ill., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Jun. 3, 1983, Ser. No. 500,812

Int. Cl.⁴ B01F *3/04*; A61M *11/02*

U.S. Cl. 261—78 A **13 Claims**



1. A nebulizer for converting liquid into aerosol, comprising:

a housing having an open top end, said housing having a bottom, an elongated nozzle extending into said housing through said bottom said nozzle adapted and constructed to distribute gas under pressure into said housing, said housing being closed at said open top end with a fluid directing component having a funnel configuration extending downwardly forming an apex into said housing, said housing, said bottom and said fluid directing component adapted and constructed to define a liquid reservoir, said fluid directing component also having downwardly depending therefrom an open ended conduit adapted and constructed to encompass said nozzle in spaced relationship from the nozzle, said conduit means being adapted and constructed to communicate with the space between said conduit and said nozzle and said housing at the bottom portion thereof, said conduit extending upwardly above the apex of the funnel means and terminating in an end having a wall which has an opening therethrough in axial alignment with said nozzle, said funnel means being closed across substantially its widest opening with a cap, said cap having an egress port, the underside of said cap having a protrusion extending downwardly and terminating with a rounded end and in axial spaced relationship with said end of said conduit extending upwardly above the apex of the funnel means, whereby entrained liquid in said gas is distributed against said rounded end, the underside of said cap having a downwardly depending baffle surrounding said protrusion in spaced relationship therewith.

4,560,520
SINGLE-LAYER ELASTIC TUBULAR FILM OF POLYAMIDE USED FOR PACKAGING PASTE SUBSTANCES AND A PROCESS FOR THE PRODUCTION OF SUCH FILM

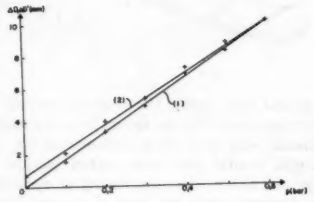
Gayyur Erk, Gorsheimertal, and Rudi Korlatzki, Laudenbach, both of Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Company, Fed. Rep. of Germany

Division of Ser. No. 517,137, Jul. 25, 1983. This application Jun. 13, 1984, Ser. No. 620,250

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227945

Int. Cl.[4] C21C 7/00; F16L 11/00

U.S. Cl. 264—22 11 Claims



1. A process for the production of a tubular film consisting of at least a polyamide that can absorb at least 0.5% of its weight in water up to saturation, which tubular film is used for packaging and casing foodstuffs in paste form, especially foodstuffs that are packed when hot or are subject to heat-treatment after packaging, comprising the steps of:

extruding a primary tube of polyamide and simultaneously multi-axially stretching the primary tube; and

subjecting the extruded and multi-axially stretched primary tube to a controlled shrinkage by at least 15% and at most 40% in the transverse and the longitudinal direction in relation to its transverse and longitudinal dimension after stretching, at temperatures above 90° C., thereby thermally fixing the primary tube.

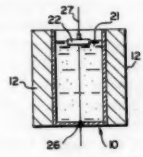
4,560,521
MAINTAINING HOMOGENEITY IN A MIXTURE

Jorg-Hein Walling, Beaconsfield; Gerald Arbuthnot, Chateauguay, and Michael A. Shannon, Glenburnie, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 6, 1984, Ser. No. 597,603

Int. Cl.[4] B29B 7/04, 15/14

U.S. Cl. 264—24 7 Claims



1. A method of maintaining homogeneity in a mixture of a fluid carrier and a quantity of magnetically permeable particles comprising:

holding the mixture within a fixed cylindrical container; and

subjecting the mixture to the influence of a magnetic field which is rotating around the fixed container and which, at any instant, is centered about its own axis lying outside the container and having directional components extending in a circumferential sense and in an axial sense of the container, so as to be inclined relative to the axis of the container, said magnetic field created by sequentially energizing a plurality of electrical coils disposed in side-by-side relationship around the container, each coil having its axis extending in a circumferentially inclined sense to the container axis.

4. Apparatus for maintaining homogeneity in a mixture of a fluid carrier and a quantity of magnetically permeable particles comprising a fixed container for holding the mixture and a plurality of electrical coils disposed, for multiphase operation, side-by-side around the container, each coil having its axis extending in a circumferentially inclined and axially inclined sense of the container.

4,560,522
PROCESS FOR PREPARING POLY-PIPERAZINAMIDE ANISOTROPIC SHAPED ARTICLES

Catia Bastioli; Giuseppe Gianotti; Adriano Mattera, and Paolo Parrini, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jun. 30, 1983, Ser. No. 509,655

Claims priority, application Italy, Jul. 1, 1982, 22179 A/82

Int. Cl.[4] B29D 27/04; D01F 6/00

U.S. Cl. 264—41 7 Claims

1. A process for the preparation of polypiperazinamide anisotropic shaped articles suitable for reverse osmosis consisting of:

(a) preparing a solution of a polypiperazinamide in an organic polar solvent;

(b) transforming said solution into a shaped article by spreading it onto a flat or tubular support, or by extruding it through a spinneret for hollow fibers;

(c) gelating the shaped articles by phase inversion, by passage thereof through a coagulating bath selected from the group consisting of polyfunctional alcohols, mixtures of polyfunctional alcohols with a quantity of water not exceeding 20% by weight, and aqueous solutions of electrolytes in a concentration of 10% to 40% by weight, and, optionally

(d) heat-treating the shaped article thus obtained.

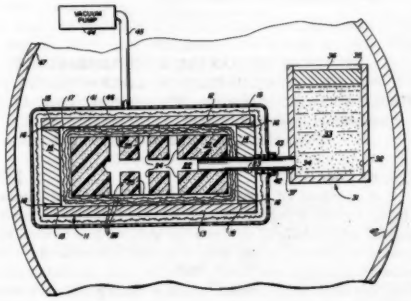
4,560,523
INTRUSION MOLDING PROCESS FOR FORMING COMPOSITE STRUCTURES

Ralph M. Plumley, Lancaster, and Henry H. Renaud, Jr., Marlboro, both of Mass., assignors to A&M Engineered Composites Corporation, Marlboro, Mass.

Filed Apr. 30, 1984, Ser. No. 605,202

Int. Cl.[4] B29C 17/08; B32B 5/16

U.S. Cl. 264—102 17 Claims



1. The method of forming a composite structure including the steps:

forming a syntactic foam core having internal communicating passages that terminate with an inlet opening and a plurality of discharge openings in the outer surface of said core;

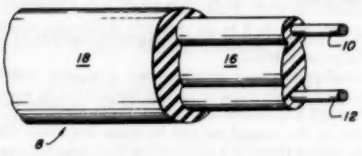
wrapping said syntactic foam core with a plurality of layers of porous preimpregnated laminating material;
positioning said wrapped core in a cavity of mold having an inlet communicating with one of said openings;
connecting a source of uncured syntactic foam resin mix to said inlet;
evacuating said mold;
forcing said uncured resin mix through said inlet opening, said passages and said discharge openings to fill said mold between said core and said laminating material; and
curing said resin mix and said preimpregnated laminating material to provide with said core a rigid composite structure.

4,560,524

METHOD OF MANUFACTURING A POSITIVE TEMPERATURE COEFFICIENT RESISTIVE HEATING ELEMENT

Jack H. Smuckler, 9 Countryside La., Marblehead, Mass. 01945

Filed Apr. 15, 1983, Ser. No. 485,424
Int. Cl.[4] B09C *71/02;* **H01H** *37/00*
U.S. Cl. 264—105 **11 Claims**



1. A process for producing a positive temperature coefficient resistance element comprising the steps of:
A. blending a polymer having at least about 20% crystallinity as determined by X-ray diffraction and having a melt flow index of at least one with an effective amount of up to about 20% by weight of carbon black to attain a suitable volume resistivity when voltage is applied to the resulting composition;
B. placing the composition of step A in contact with a pair of spaced-apart conductive electrodes;
C. maintaining the product of step B at a temperature above the melting point of the polymer component of the blend of step A for no more than about one hour and then cooling to produce an approximately constant room temperature volume resistivity of the composition of less than about 100,000 ohm-cm and thereby obtain a temperature self-regulating resistance element.

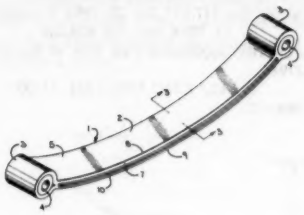
4,560,525

METHOD OF MAKING A MOLDED FIBER REINFORCED PLASTIC LEAF SPRING

William E. Ryan, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 19, 1983, Ser. No. 543,354
Int. Cl.[4] B29C *43/18*
U.S. Cl. 264—136 **2 Claims**

1. A method of producing a fiber reinforced plastic leaf spring having a curved central section and end sections connected to the ends of said central section, said central section having a neutral stress axis disposed substantially midway between its upper and lower surfaces, said method comprising the steps of forming a female mold including a bottom wall and a pair of side walls and rounded corners connecting said bottom wall and said side walls, forming a generally concave male mold having a top wall and a pair of side walls connected to said top wall by rounded inside corners, said side walls terminating in generally flat laterally extending extremities, placing substantially continuous strands of fibrous material impregnated with a liquid thermosetting resin in said female mold, inserting the male mold in the female mold with said laterally extending extremities positioned inside said side walls of said female molds, compressing said fibrous material by moving the molds relative to each other to cause a portion of said liquid resin to be extruded laterally along the joint between said molds in the form of flash, discontinuing the compressing of said fibrous material when said laterally extending extremities



are at said neutral axis, curing the resin to provide a rigid molded leaf spring, removing the spring from the molds, and thereafter severing said flash along a plane that lies substantially along said neutral axis, said central section having rounded upper and lower edges and having an upwardly facing shoulder disposed along the neutral axis and extending longitudinally along each side of said central section.

4,560,526

PROCESS FOR PREPARING MOLDED SILICON CARBIDE PRODUCT

Masatoshi Okumura, Kitamoto, Japan, assignor to Shin Nisso Kako Co., Ltd., Japan

Filed Mar. 12, 1984, Ser. No. 588,758
Claims priority, application Japan, Mar. 18, 1983, 58-44502
Int. Cl.[4] C04B *35/56*
U.S. Cl. 264—328.2 **28 Claims**

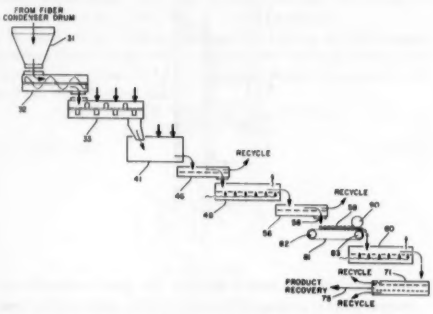
1. A process for preparing a molded silicon carbide product, which process comprises molding a mixture of silicon carbide powder, an organosilicon compound and a lubricant selected from the group consisting of higher fatty acids, higher fatty acid esters, higher fatty acid amides, higher alcohols and paraffin wax into a compact and sintering the compact wherein the lubricant has the following properties:
(a) it does not substantially evaporate during such operations as mixing, drying, molding, etc.;
(b) it is in liquid or solid form, and when it is a solid, it has a melting point of 40° C. or higher;
(c) it exhibits low viscosity in a melt of a mixture of the lubricant and organosilicon compound; and,
(d) it undergoes almost complete evaporation at or below a temperature at which the organosilicon compound is pyrolyzed, i.e., at temperatures up to 500° C.;
wherein the organosilicon compound is one or more compounds selected from those in which
(1) silicon atoms are bonded only to carbon atoms;
(2) besides the bonds between silicon atoms and carbon atoms, silicon atoms are bonded to hydrogen atoms;
(3) besides the bonds between silicon atoms and carbon atoms, there are bonds formed between silicon atoms and halogen atoms;
(4) in addition to the bonds between silicon atoms and carbon atoms, there are bonds established between silicon atoms per se; and
(5) there are two or more types of bonds out of the above-mentioned bonds (2) through (4), or a polycondensation product, obtained by polycondensation of these compounds, containing silicon-carbon bonds as its principal backbone structure; and wherein the ratio of lubricant to organosilicon compound is in the range of 0.2 to 1 to 2.0 to 1.

4,560,527

METHOD OF MAKING AGGLOMERATED CELLULOSIC PARTICLES USING A SUBSTANTIALLY HORIZONTAL ROTATING DRUM

Elwood W. Harke, Outagami County; Robert C. Sokolowski, Calumet County, and Russell L. Johnson, Waupaca County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 24, 1984, Ser. No. 603,391
Int. Cl.[4] B29C *67/02*
U.S. Cl. 264—500 10 Claims



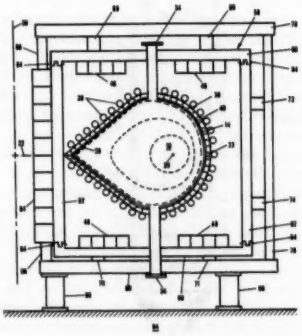
1. A method for making cellulosic particles comprising:
(a) agglomerating a moist blend of fibers, aggregates of fibers, and/or fiber-sized pieces of a fibrous cellulosic material in a substantially horizontal rotating drum to form individual agglomerated particles;
(b) compacting the surface of the agglomerated particles to form a densified skin substantially free of protruding fibrils; and
(c) drying the agglomerated particles.

4,560,528

METHOD AND APPARATUS FOR PRODUCING AVERAGE MAGNETIC WELL IN A REVERSED FIELD PINCH

Tihiro Ohkawa, La Jolla, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Apr. 12, 1982, Ser. No. 367,343
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—121 32 Claims



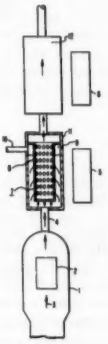
18. Apparatus for generating and containing plasma with a magnetic well reversed field pinch, said apparatus comprising:
means defining a toroidal chamber having a major toroidal axis and a minor toroidal axis and a small aspect ratio;
means for generating a plasma within said chamber;
means for passing current through said plasma in the direction in which said minor toroidal axis extends to form a strongly reversed magnetic field pinch configuration therein which generates a set of nested closed magnetic flux surfaces defining an elliptic magnetic axis within said plasma extending in the direction of current flow and produces a safety factor q which changes in sign within said plasma at a said magnetic flux surface where the component of the magnetic field in the direction in which said minor axis extends changes sign; and
means for generating at least one hyperbolic magnetic axis outside substantially all of said plasma and between said elliptic magnetic axis and said major toroidal axis to form an average magnetic well encompassing substantially all of said plasma.

4,560,529

FUEL WASHOUT DETECTION SYSTEM

Richard P. Colburn, Pasco, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 1, 1983, Ser. No. 462,852
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—251 5 Claims



1. A system for the detection of failed fuel for nuclear reactors comprising:
(a) a path for flow of a portion of core coolant therethrough, said path including a first portion and a second portion;
(b) a first radiation detector being in juxtaposition to said first portion of said path;
(c) a second radiation detector being in juxtaposition to said second portion of said path, said second portion being downstream of said first portion; and
(d) a filter contained within said first portion, said filter adapted to retain thereon particulate matter which may be contained by said core coolant, said filter having holes of about 10 μm in diameter.

4,560,530

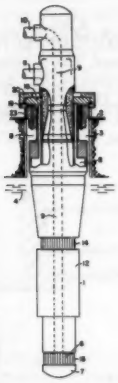
DEVICE FOR PROVIDING PROTECTION AGAINST HEAT AND RADIATION FOR AN INTERMEDIATE HEAT EXCHANGER IMMERSED IN A NUCLEAR REACTOR VESSEL

Jean-Louis Pierrey, Bourg la Reine, and Michel Thévenin, Fresnes, both of France, assignors to Novatome, Le Plessis Robinson, France

Filed Mar. 7, 1983, Ser. No. 472,815
Claims priority, application France, Apr. 2, 1982, 82-05769
Int. Cl.[4] G21C *1/02, 1/32*
U.S. Cl. 376—290 4 Claims

1. In a nuclear reactor system having a vessel filled with liquid metal constituting the primary coolant of the reactor,

said vessel being covered by a very thick slab (2), an intermediate heat exchanger having a portion thereof immersed in said coolant, an upper portion of said heat exchanger passing through said slab and resting on said slab via a flange fixed to said upper portion, said exchanger comprising a sleeve (8) fixed to said flange, inside which secondary liquid metal heated by primary fluid circulates, said sleeve (8) disposed vertically with its axis along the axis of said heat exchanger consisting of a double-walled sleeve in said upper part, the two walls of said sleeve (8) being in the form of two coaxial sleeves joined by a connector of Y-shaped cross-section and comprising an inner sleeve (8*a*) in which the secondary liquid metal circulates and an outer sleeve (8*b*) passing through said slab in such manner that a peripheral space is provided around said outer sleeve



(8*b*), and a device for providing protection against heat and radiation comprising a sleeve (27) coaxial with said inner and outer sleeves (8*a*, 8*b*), fixed under said flange (18), in the peripheral space around said outer sleeve (8*b*), said sleeve (27) having a lower portion carrying a solid annular piece (30) for providing insulation against radiation, the cross-section of said solid annular piece being such that it occupies the greater part of the cross-section of said peripheral space, and said sleeve (27) having an upper portion under said flange (18), carrying an annular heat insulation means (32), said Y-shaped connector (25) being located in the region of the central part of said sleeve (27), between said solid annular piece (30) and said heat insulation means (32) said solid annular piece (30) being spaced apart from said annular heat insulation means (32).

4,560,531

DEVICE FOR PARTITIONING OFF THE CORE OF A NUCLEAR REACTOR

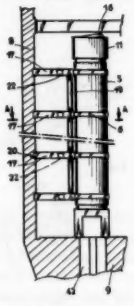
Jean-Luc Leroy, Gif-sur-Yvette, France, assignor to Framatome, Courbevoie, France

Filed May 20, 1981, Ser. No. 265,486
Claims priority, application France, Jun. 6, 1980, 80 12581
Int. Cl.[4] G21C *3/00*
U.S. Cl. 376—302 **3 Claims**

1. A device for partitioning off the core of a nuclear reactor having prismatic fuel assemblies arranged side by side at the periphery of said core inside an envelope which bounds at the sides a space surrounding the core in which a cooling liquid flows in the direction longitudinal to said fuel assemblies, said partitioning comprising

(a) a plurality of first plates, called blenders, attached to said envelope fo said core, arranged transversely with respect to said assemblies at regular intervals in the longitudinal direction in said space surrounding said core, bearing against said fuel assemblies;

(b) a plurality of second plates disposed in a longitudinal direction with respect to said fuel assemblies, arranged in gaps between two successive blenders, and slightly stepped back with respect to said assemblies and out of contact therewith, each of said second plates being in contact by one of its end portions with one of the blenders bounding the gap in which said second plate is arranged and is connected to the latter by screwing, while a certain play exists between the other end of said second plate and



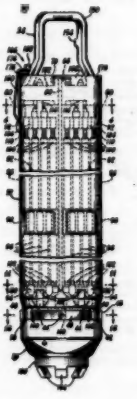
the other blender which bounds the gap in which said second plate is arranged, the latter being connected to said other blender by a smooth pin which engages in an opening at the corresponding end of said seond plate enabling free displacement of said second plate with respect to said other blender under the effect of thermal expansion under predetermined conditions of operation of said reactor.

4,560,532

NUCLEAR FUEL ASSEMBLY

Robert F. Barry, Monroeville; Susan C. Delzell; Wilson, John F., both of Murrysville, all of Pa., and Theodore W. Nylund, Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 368,555, Apr. 15, 1982. This application Nov. 10, 1983, Ser. No. 550,669
Int. Cl.[4] G21C *3/30*
U.S. Cl. 376—434 **7 Claims**



1. A nuclear fuel assembly comprising an elongated, impervious outer flow channel; and a plurality of fuel bundles separately disposed within and along the length of said outer flow channel, wherein each of said fuel bundles includes an upper tie plate, a lower tie plate and a plurality of nuclear fuel rods

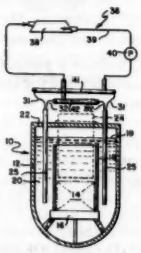
disposed between said upper tie plate and said lower tie plate, at least two said fuel rods being tie rods interconnecting said upper and lower tie plates; further comprising an upper yoke having a fuel assembly lifting handle secured thereto, said upper yoke being secured to said outer flow channel at one longitudinal end of said outer flow channel; and further comprising means for enabling relative axial movement between said upper tie plate and said upper yoke.

4,560,533

FAST REACTOR POWER PLANT DESIGN HAVING HEAT PIPE HEAT EXCHANGER

Paul R. Huebotter, Western Springs, and George A. McLennan, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 30, 1984, Ser. No. 645,654
Int. Cl.[4] G21C *15/00*
U.S. Cl. 376—367 **6 Claims**



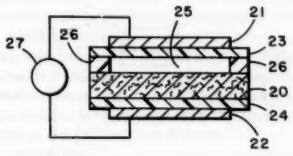
1. In a nuclear reactor power plant having a reactor vessel closed by a deck, means for generating fission reaction heat within the vessel, a pool of primary coolant in the vessel for receiving the fission heat, and a pressurized water coolant loop having steam-turbine means located remotely of the reactor vessel, an improved arrangement for transferring heat between the primary and water coolants, comprising a plurality of sealed heat pipe structures depending from the deck and submerged within the primary coolant to be exteriorly heated thereby, each of said heat pipe structures having a heat pipe wall which contacts said primary coolant and defines an interior chamber inside each of said heat pipe structures, a coolant line extending within each heat pipe structure but spaced therefrom, means for connecting said coolant line in the pressurized water coolant loop, a vaporizable heat transfer medium sealed within the interior chambers, said heat transfer medium being capable of being vaporized by absorbing heat from said heat pipe walls, said heat transfer medium also being capable of being condensed by transferring heat to said coolant lines, a plurality of baffles located in the heat pipe structures and dividing each interior chamber up along the length of the coolant line, each of said baffles being generally horizontally disposed to collect condensed heat transfer medium thereon as a layer of condensate, and the baffles being pitched to direct the liquid layer flow toward the heat pipe wall, at least one perforation formed in each said baffle for allowing the migration of the heat transfer medium in vapor form transversely of said baffles, and an upturned edge on said perforations, said upturned edge forming a lip to contain the layer of condensated liquid on said baffles, whereby the heat transfer medium is flowable generally in directions transverse to said structure and wall for effectively transferring heat from the primary coolant to the water coolant via changes of phase by vaporizing off of the heat pipe structure and condensing onto the water coolant line, the pitch in said baffles increasing the transfer of heat by causing condensed heat transfer medium to flow more quickly to the heat pipe structure.

4,560,534

POLYMER CATALYST TRANSDUCERS

Wei-jen Kung, East Lansing, Mich., and Paul O. Vogelhut, Mishawaka, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 2, 1983, Ser. No. 548,152
Int. Cl.[4] G01N *27/00*
U.S. Cl. 422—68 **10 Claims**



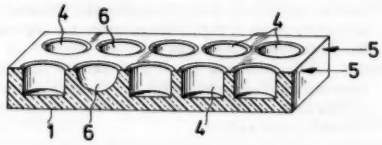
1. Apparatus for detecting a constituent in a fluid sample by measuring changes in conductivity, said apparatus comprising:
a polymer catalyst transducer consisting essentially of a metal-organic or metal-inorganic catalyst and a polymer of a nuclearly unsaturated heterocyclic compound;
metal electrodes in either direct or indirect contact with the polymer catalyst transducer for detecting changes in the conductivity of said polymer catalyst transducer when said transducer is contacted with a fluid sample; and
means connected to said electrodes for measuring changes in the conductivity of the polymer catalyst transducer.

4,560,535

SAMPLE COLLECTOR

Bernhard Bouchée, Kriftel, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,510
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 8300950[U]
Int. Cl.[4] B01L *3/14, 9/06;* B65D *1/36*
U.S. Cl. 422—102 **6 Claims**



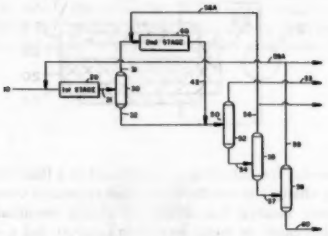
1. An apparatus for collecting test samples comprising:
a support plate having an upper surface and including a predetermined number of recesses aligned in at least one row along said upper surface, the internal dimensional configuration of one of said recesses in each of said rows being different from the configurations characteristic of the remainder of said recesses in said row, said recess with the different internal dimensional configuration being asymmetrically disposed along each of said rows; and
a plurality of adjacent, integrally connected vessels aligned in at least one line, the number of said vessels in each of said lines being equivalent to the predetermined number of said recesses in said at least one row of recesses, said vessels having base portions for mating with respective ones of said recesses and being supported thereby, said base portion of each of said vessels having a shape corresponding to the internal dimensional configuration of said mated recess and the base of one of said vessels in said line being different from the remainder of said vessels in said line, such that each of said lines of vessels is supported within a corresponding one of said rows in only one sequence.

4,560,536

CATALYTIC CONVERSION WITH CATALYST REGENERATION SEQUENCE

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 526,852, Aug. 26, 1983, Pat. No. 4,487,985.
This application Sep. 10, 1984, Ser. No. 648,414
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—116 **4 Claims**



1. An integrated multi-stage system for catalytic conversion of organic compounds comprising

a bank of fixed bed catalytic reactors operatively connected to be placed sequentially in selected system stage positions or a regeneration loop;

means for feeding a first reactant stream to a primary stage comprising at least one moderate temperature reactor containing active catalyst;

means for feeding a second reactant stream to a secondary stage comprising at least one higher temperature reactor containing significantly inactivated catalyst previously used in the primary stage at lower temperature;

fluid handling means for sequentially replacing a primary stage reactor containing partially inactivated catalyst with a reactor from the reactor bank containing fresh or regenerated catalyst, while maintaining continuous conversion in the system;

means for advancing at least one replaced primary stage reactor containing partially inactivated catalyst to the secondary stage at higher temperature for conversion of the second reactant stream; and

means for regenerating inactivated catalyst in a reactor removed from secondary stage service in a separate regeneration loop, while maintaining continuous conversion in the multi-stage system.

4,560,537

MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO HYDROCARBONS

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 548,377, Nov. 3, 1983, Pat. No. 4,482,772.
This application Aug. 16, 1984, Ser. No. 641,245
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—190 **10 Claims**

1. A continuous multi-stage catalytic system for converting oxygenated feedstock to liquid hydrocarbons comprising

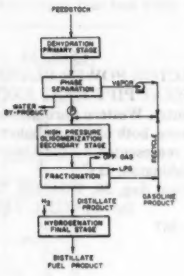
primary stage catalytic means containing dehydration catalyst for converting oxygenate to olefinic and aromatic hydrocarbons;

interstage separation means for recovering water from the primary stage effluent stream;

means for pressurizing and heating primary stage hydrocarbon effluent stream rich in C_3^+ components;

secondary stage catalytic oligomerization reactor means containing medium pore shape selective zeolite oligomerization catalyst for converting said olefinic hydrocarbons in the primary stage effluent stream to liquid hydrocarbons comprising a major amount of distillate in the presence of aromatic hydrocarbons;

fractionation means for separating secondary stage effluent into a light hydrocarbon stream rich in C_3–C_4 aliphatic hydrocarbons, a C_5^+ gasoline stream and distillate range stream;



means for recycling at least a portion of the C_5^+ gasoline stream to the secondary stage for combining with substantially the entire primary stage C_3^+ hydrocarbon stream; and

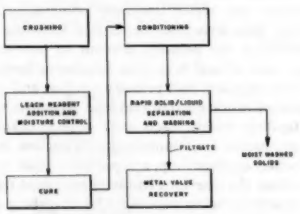
hydrotreating reactor means for catalytically hydrogenating olefinic and aromatic components of the distillate stream to provide a stabilized distillate product.

4,560,538

CURING AND LEACHING PROCESS FOR METAL ORES

Kenneth K. Yung, Kingwood, Tex.; Craig B. Barlow, and Joe R. Glass, both of Casper, Wyo., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 19, 1979, Ser. No. 105,184
Int. Cl.[4] C01G *43/00*
U.S. Cl. 423—3 **6 Claims**



1. In the process of extracting metal values from mineral ores which comprises comminuting said ores into smaller ore particles, curing said ores and leaching said ores, the improvement which comprises the steps in combination of:

(a) contacting said ores with only a sufficient amount of a selective curing reagent to convert said metal values into a soluble state and to avoid appreciable leaching;

(b) conditioning said cured ore by mixing it with a flocculating agent and sufficient water to convert it into a pumpable and flocculated state;

(c) conveying said cured, solubilized, conditioned, flocculated ore without additional processing to an operational horizontal-belt, vacuum, filter dewatering/washing forced-flow apparatus;

(d) depositing a single relatively thin layer of said conveyed ore, not exceeding 12 inches in thickness on said apparatus; and

(e) rapidly washing said thin ore layer several times with a suitable washing solution in order to leach by dissolving

and removing substantially all solubilized metal values from said solubilized ore within a wash time period not exceeding about 30 minutes per ore particle using about 0.25 to 3 parts by weight of washing solution per weight of ore in said layer.

4,560,539

REMOVAL OF AMMONIA FROM SODIUM TUNGSTATE SOLUTIONS

Tai K. Kim, Towanda; Robin W. Munn, Sayre; Carl W. Boyer, Wyalusing, and Martin C. Vogt, Monroeton, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 11, 1985, Ser. No. 690,549
Int. Cl.[4] C01G *41/00*
U.S. Cl. 423—59 **2 Claims**

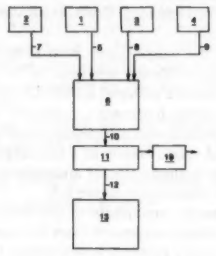
1. A process for removing ammonia from a sodium tungstate solution said process comprising heating said sodium tungstate solution at from about 80° to about 95° C. while at the same time maintaining the pH above about 9.4 by addition of sodium hyroxide to said sodium tungstate solution, the heating being carried out for a sufficient time to allow for the essentially complete removal of said ammonia.

4,560,540

METHOD FOR RECOVERING USEFUL PRODUCTS FROM WASTE PRODUCTS OBTAINED WHEN MANUFACTURING ALUMINIUM FLUORIDE

Lennart H. A. Berglund, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE82/00434, § 371 Date Aug. 31, 1983, § 102(e) Date Aug. 31, 1983, PCT Pub. No. WO83/02444, PCT Pub. Date Jul. 21, 1983
PCT Filed Dec. 21, 1982, Ser. No. 534,464
Claims priority, application Sweden, Jan. 7, 1982, 820045
Int. Cl.[4] C01F *1/00, 7/54*
U.S. Cl. 423—116 **11 Claims**



1. A method for recovering usable products derived from the manufacture of aluminum fluoride from H_2SiF_6 and $Al(OH)_3$ to form liquid —AlF_3, and thereafter treating said —AlF_3 to form insoluble, anhydrous AlF_3, said manufacture leaving mother liquors and washing waters containing aluminum, and fluorine in amounts below the solubility limit of anhydrous AlF_3 and containing contaminating silica, characterized by collecting the mother liquors and washing waters, and adding alkali metal ions in the form of an alkali metal salt, adjusting the hydrogen ion concentration of said collected solution to a pH of 2.0 to 3.0 by adding an alkali metal base while maintaining a temperature of said collected solution above about 50° C., and isolating the alkali fluoride aluminate thereby precipitated.

4,560,541

PRODUCTION OF LOW SILICA CONTENT, HIGH PURITY ALUMINA

Gerald E. Davis, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 15, 1984, Ser. No. 589,927
Int. Cl.[4] C01F *7/22*
U.S. Cl. 423—126 **9 Claims**

1. A process for the reduction of the impurity content in alumina produced from a solid hydrated alumina containing a significant content of hydrochloric acid-soluble and -insoluble impurities, which comprises:

a. reacting the impure hydrated alumina with at least a stoichiometric amount of concentrated hydrochloric acid to convert at least a portion of the hydrated alumina to a reaction product comprising dissolved aluminum chloride and solid aluminum chloride hexahydrate;

b. adjusting the water content of the resultant solution to allow for complete dissolution of the aluminum chloride hexahydrate portion of the reaction product, as well as soluble metal chloride impurities;

c. subjecting the saturated aluminum chloride solution to liquid/solid separation to separate solid undissolved impurities and any unreacted hydrated alumina from the solution;

d. adjusting the acid content of the solution to reduce the solubility of the aluminum chloride and cause at least a portion of the aluminum chloride to precipitate as crystalline aluminum chloride hexahydrate;

e. recovering the solid precipitated aluminum chloride hexahydrate from the acid solution containing soluble impurities; and

f. calcining the recovered solid aluminum chloride hexahydrate to effect dissociation and to separate HCl and water and form substantially anhydrous amorphous or crystalline alumina having a content of acid-soluble and -insoluble impurities lower than the corresponding impurity level in the hydrated alumina.

4,560,542

METHOD FOR THE PREPARATION OF ZEOLITES USING A LOW WATER LOW ALKALI METAL CONTENT GEL

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 6, 1984, Ser. No. 679,136
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **15 Claims**

1. In a method for the preparation of a crystalline aluminosilicate which comprises:

(a) forming a reaction mixture comprising a source of alumina, a source of silica, a source of an organic templating agent and water;

(b) maintaining said mixture at a temperature ranging from about 75° to about 200° C. until crystals of a zeolite are formed, and

(c) recovering said zeolite from said reaction mixture, the improvement which comprises:

(d) first forming an aluminosilicate gel having less than about 10 mole H_2O per gram atom of silicon and an alkali metal content of less than about 0.4 atom per atom of silicon, said aluminosilicate gel having been prepared by reacting a source of silica, a source of alumina and water to form an aluminosilicate hydrogel, washing said hydrogel to remove at least a portion of said residual soluble salts, and drying the washed hydrogel at conditions to form said gel having less than 10 moles H_2O per gram atom of silicon, and

(e) subsequently mixing said organic templating agent with said gel, said reaction mixture having a mole ratio of H_2O/SiO_2 ranging from 2 to 10.

4,560,543

PROCESS FOR DESULFURIZATION OF HOT WASTE GAS

Leif D. Caspersen, Horsholm; Karsten S. Felsvang, Allerod, and Christian Schwartzbach, MÅlov, all of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed May 30, 1984, Ser. No. 615,434

Claims priority, application Denmark, Jun. 3, 1983, 2553/83

Int. Cl.⁴ C01B *17/00*; B01J *8/00*

U.S. Cl. 423—242 **19 Claims**

1. A process for desulfurization of a hot waste gas containing sulfur oxides, comprising the steps of

(i) injecting a stream of the waste gas downwards in the upper part of an absorption chamber,

(ii) atomizing an aqueous liquid containing an absorbent for sulfur oxides, said absorbent being selected from the group consisting of limestone, slaked lime and sodium carbonate, into said downward gas stream in the absorption chamber, thereby drying the atomized liquid and forming a particulate material of absorbent partly reacted with sulfur oxides,

(iii) adjusting the amount and water content of said liquid dependent on the drying capacity of the downward gas stream to such values that the drying of the atomized liquid in said downward gas stream produces a particulate material having a moisture content of at least 3% by weight,

(iv) introducing an upward stream of gas in the bottom part of the absorption chamber at a rate sufficient for fluidizing and drying the particulate moist material produced in step (ii) thereby producing a fluidized layer of said particulate material in the bottom part of the absorption chamber,

(v) withdrawing particulate spent absorbent and a stream of gas of reduced sulfur oxide content from the absorption chamber.

4,560,544

PROCESS FOR THE PREPARATION OF ACICULAR α-FEOOH FOR MAGNETIC RECORDING MATERIALS

Kazuo Nakata; Tsuneo Ishikawa, both of Moriyama; Taro Amamoto, and Toshihiko Kawamura, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Continuation of Ser. No. 443,888, Nov. 23, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,241

Claims priority, application Japan, Nov. 27, 1981, 56-190166

Int. Cl.⁴ C01G *49/06*

U.S. Cl. 423—266 **7 Claims**

1. A process for preparing acicular α-FeOOH particles for use in the preparation of a magnetic recording material by partially neutralizing and then oxidizing a ferrous salt soltuion in the presence of a phosphoric acid or a salt thereof to form seed crystals of α-FeOOH, and then further oxidizing said solution while neutralizing said solution with an alkali to effect growth of the seed crystals, wherein the seed crystals are formed at a temperature of 50° to 100° C. by using pyrophosphoric acid or a salt thereof as said phosphoric acid in an amount of 0.05 to 0.8% by weight as calculated in terms of P based on the amount of the α-FeOOH produced, and the partial neutralization of the solution is such that the concentration of the ferrous ions in the solution at the time of the seed crystal formation is 40 g/l or higher, and said seed crystals of α-FeOOH are grown 1.0 to 3.5 times greater than the total initial weight thereof at a temperature of 50° to 100° C. wherein the particle size distribution of the α-FeOOH is lower than the α-FeOOH prepared as above but where the concentration of the ferrous ions after the partial neutralization of the solution and at the time of seed crystal formation is less than 40 g/l.

4,560,545

BASIC ALUMINUM MAGNESIUM CARBONATE

Robert G. W. Spickett; Jacinto M. Mauri, and Jesûs E. B. Puchades, all of Barcelona, Spain, assignors to Anphar S.A., Madrid, Spain

Division of Ser. No. 12,435, Feb. 15, 1979, Pat. No. 4,447,417. This application Mar. 5, 1984, Ser. No. 586,186

Claims priority, application United Kingdom, Feb. 17, 1978, 6416/78

Int. Cl.⁴ A61K *33/10*

U.S. Cl. 423—430 **3 Claims**

1. A process for the preparation of a basic aluminium magnesium carbonate of the formula $Al_2Mg_6(OH)_{14}(CO_3)_2.4H_2O$ which comprises heating a mixture of aluminium hydroxide and magnesium hydroxide in the appropriate molecular proportions in the presence of carbon dioxide supplied by passing a stream of carbon dioxide gas through the mixture in an aqueous medium containing ammonia or a water-soluble organic nitrogen-containing base selected from a mono-, di- or trialkylamine containing up to 4 carbon atoms in the alkyl radical(s), or pyridine or piperidine, the amount of ammonia or water-soluble organic base present in the reaction mixture being at least 6 moles per mole of Al_2O_3 present, at a temperature between 70° and 100° C. at atmospheric pressure, and separating the said aluminium magnesium carbonate from the reaction mixture.

4,560,546

CHROMIUM HYDROXIDE PRECIPITATE OBTAINED BY A CONTINUOUS PROCESS FOR THE REMOVAL OF CHROMIUM FROM WASTE WATERS

Diego Perrone; Alberto Patrone, both of Cogoleto, and Elvio Caffarelli, Genoa, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

Continuation of Ser. No. 261,885, May 8, 1981, Pat. No. 4,401,573. This application Apr. 13, 1983, Ser. No. 484,614

Claims priority, application Italy, May 12, 1980, 21975 A/80

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.⁴ C02F *1/54*

U.S. Cl. 423—607 **11 Claims**

1. Chromium hydroxide precipitate characterized by being perfectly filterable and at least 99% soluble in acids obtained by a process for removing Cr_2O_3 from waste waters comprising the steps of:

pretreating the waste water with at least 0.3% by weight acetic acid or acetate ion, and

adding an alkaline material selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonium hydroxide and magnesium oxide continuously to the pretreated waste waters at a temperature of between 40° C. and the boiling point, at atmospheric pressure, wherein the pH is maintained above 6.5,

wherein a sandy precipitate of chromium hydroxide is obtained which is separated from the waste water by filtering, said sandy precipitate containing Cr_2O_3 in an amount of about 20–40% by weight.

4,560,547

PRODUCTION OF HYDROGEN FROM OIL SHALE

Frank C. Schora, Palatine; John C. Janka, Forest Park, and Harlan L. Feldkirchner, Elk Grove Village, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 28, 1982, Ser. No. 393,194

Int. Cl.⁴ C01B *3/24*

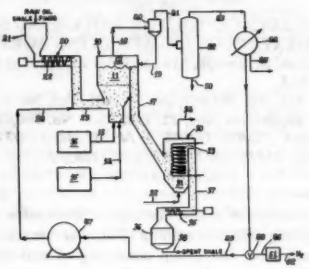
U.S. Cl. 423—650 **48 Claims**

1. A process for the production of hydrogen from oil shale fines comprising:

introducing raw oil shale fines having average diameters less than about 0.125 inch directly into a fluidized reaction bed maintained within a reaction vessel, said bed having tem-

peratures about 1200° to about 2000° F. providing rapid heat-up of said oil shale fines;

fluidizing said reaction bed by upward passage of steam and oxygen, said steam being introduced in the weight ratio of about 0.1 to about 10 on the basis of the organic carbon content of said oil shale and said oxygen being introduced in less than the stoichiometric quantity for complete com-



bustion of the organic carbonaceous kerogen content of said oil shale;

reacting said steam and oxygen with the organic carbon components of said oil shale producing spent shale and product gas comprising hydrogen and carbon monoxide; and

withdrawing said product gas separately from spent shale.

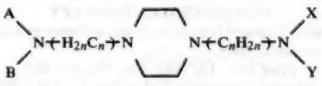
4,560,548

BONE SEEKING TC-99M COMPLEXES OF PHOSPHONATE DERIVATIVES OF BIS(AMINOALKYL)PIPERAZINE

Jaime Simon, Angleton; David A. Wilson, Richwood, both of Tex.; Wynn A. Volkert, Columbia, Mo., and Druce K. Crump, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 10, 1984, Ser. No. 598,633
Int. Cl.⁴ A61K *49/00, 43/00*
U.S. Cl. 424—1.1 **20 Claims**

1. A bone seeking complex of a radioactive nuclide and a compound having the structural formula



wherein n is 2 or 3 and wherein substituents A, B, X and Y each are independently selected from radicals consisting of hydrogen, hydroxyalkyl (wherein the alkyl group contains 2–6 carbon atoms), methylenephosphonic, methylene-, ethylene- and propylenesulfonic, hydroxymethyl-, hydroxyethyl- and hydroxypropylsulfonic acid radicals, carboxylic acid radicals (having 2–4 carbon atoms) and the alkali or alkaline earth metal, ammonium and amine salts of any of said phosphonic, sulfonic or carboxylic acid derivatives and wherein at least one of A, B, X and Y is a methylenephosphonic acid radical or salt thereof.

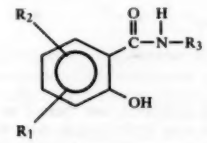
4,560,549

METHOD OF RELIEVING PAIN AND INFLAMMATORY CONDITIONS EMPLOYING SUBSTITUTED SALICYLAMIDES

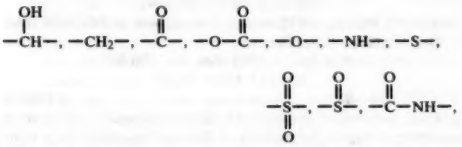
Thomas W. Ritchey, Norwood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,916
Int. Cl.⁴ A61K *9/22, 9/52, 9/70*
U.S. Cl. 424—18 **45 Claims**

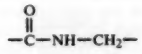
1. A medicated pad comprising a pad and, carried on said pad, an admixture of a pharmaceutically acceptable carrier and an anti-inflammatorily effective amount of an anti-inflammatory compound of the formula:



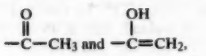
wherein the lipophilicity imparting substituents $-R_1$ and $-R_2$ which impart an octanol/water distribution function of about 4.5 to about 10 to said compound are —H, normal or branched chain or cyclic or fused ring polycyclic or non-fused ring polycyclic alkyl, alkenyl, alkynyl, aryl or heteroaryl groups optionally containing further substituents thereon, said $-R_1$ and $-R_2$ substituents comprising up to about 30 carbon atoms when taken together either attached directly to the phenyl ring provided with an amido and a hydroxyl group in an ortho orientation with respect to each other or attached to said phenyl ring through a



—NH—CH_2— or



group with the proviso that $-R_1$ and $-R_2$ are not both —H and wherein $-R_3$ is selected from the group consisting of thiazol-2-yl, benzothiazol-2-yl and R_4-substituted phenyl wherein R_4 is selected from the group consisting of —OH, —COOH, the tautomeric pair



—CH_2COOH, —$COOCH_3$, —$COOC_2H_5$, —CH_2COOCH_3, —$CH_2COOC_2H_5$, —NO_2, and $CX_1X_2X_3$, wherein X_1, X_2 and X_3 are halogen atoms.

4,560,550

SYNERGISTIC COMPOSITIONS CONTAINING 6-ALKYLIDENE PENEMS AND THEIR USE

Neal F. Osborne, West Sussex, England, assignor to Beecham Group p.l.c., England

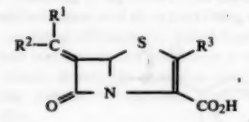
Division of Ser. No. 257,481, Apr. 23, 1981, Pat. No. 4,485,110. This application Apr. 23, 1984, Ser. No. 602,975

Claims priority, application United Kingdom, Apr. 24, 1980, 8013563

Int. Cl.[4] A61K *31/425*

U.S. Cl. 424—114 **44 Claims**

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a compound of the formula (II):



(II)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable in-vivo hydrolyzable ester thereof, wherein R^1 and R^2 are the same or different and each is hydrogen, a hydrocarbon of 1–10 carbon atoms or a pharmaceutically acceptable heterocyclic group unsubstituted or substituted with a pharmaceutically acceptable functional group; and R^3 is hydrogen, R^a or —SR^a wherein R^a is a hydrocarbon of 1–10 carbon atoms unsubstituted or substituted by hydroxy, alkoxy of 1–6 carbon atoms, alkanoyloxy of 1–6 carbon atoms, halo, mercapto, alkylthio of 1–6 carbon atoms, heterocyclicthio, amino, mono- or dialkylamino of 1–6 carbon atoms in the alkyl moiety, alkanoylamino of 1–6 carbon atoms, carboxy or alkoxycarbonyl of 1–6 carbon atoms or a pharmaceutically acceptable heterocyclic group, and an antibacterially effective amount of a penicillin or cephalosporin, in combination with a pharmaceutically acceptable carrier.

4,560,551

BEETLE ATTRACTANT

Aldona M. Pierce, and Harold D. Pierce, both of #6 - 7088 Inlet Dr., Burnaby, B.C., Canada

Filed Jun. 1, 1983, Ser. No. 500,083

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 **3 Claims**

1. A method of trapping *O. Mercator* beetles comprising exposing a trap in the vicinity of the beetles, which trap contains an amount of an unsaturated oxacyclododecanone sufficient to attract *O. Mercator* beetles, the unsaturated oxacyclododecanone selected from the group consisting of (Z)-12-methyloxacyclododec-4-en-2-one and (Z,Z)-methyloxacyclododeca-4,7-dien-2-one.

4,560,552

ANTIBIOTICS

Martin Cole, Dorking; Thomas T. Howarth, Rudwick, and Christopher Reading, Southwater, all of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 211,323, Nov. 28, 1980, abandoned, which is a division of Ser. No. 78,590, Sep. 24, 1979, abandoned, which is a division of Ser. No. 964,035, Nov. 27, 1978, abandoned, which is a continuation of Ser. No. 726,480, Sep. 24, 1976, abandoned, which is a division of Ser. No. 569,007, Apr. 17, 1975. This application Dec. 14, 1981, Ser. No. 330,456

Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74; Dec. 11, 1974, 53525/74; Ireland, Apr. 8, 1975, 792/75

Int. Cl.[4] A61K *35/00*

U.S. Cl. 424—114 **7 Claims**

1. A pharmaceutical composition for treating bacterial infections in humans and animals which comprises a synergistically effective amount of clavulanic acid, or a pharmaceutically acceptable salt thereof, and an antibacterially effective amount of a penicillin, or a pharmaceutically acceptable salt or ester thereof.

4,560,553

USE OF EUCALYPTOL FOR ENHANCING SKIN PERMEATION OF BIO-AFFECTING AGENTS

Jacob A. Zupan, St. Joseph, Mo., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 280,967, Jul. 7, 1981, Pat. No. 4,440,777. This application Nov. 21, 1983, Ser. No. 554,026

Int. Cl.[4] A61K *270/00, 31/025, 31/43, 31/44, 31/075, 31/52, 31/54, 31/65, 31/70, 31/71, 31/135, 31/195, 31/205, 31/245, 31/335, 31/415*

U.S. Cl. 424—78 **32 Claims**

1. A composition of matter for topical application comprising a biologically effective amount of at least one bio-affecting agent selected from the group consisting of anti-microbials, local anesthetics, beta-blockers and antihypertensive agents and a skin permeation enhancing amount of eucalyptol.

4,560,554

NEUTRALIZER FOR COLD WAVING

Sanae Kubo, Sagamihara, and Emiko Kawada, Yokohama, both of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Apr. 3, 1984, Ser. No. 596,225

Claims priority, application Japan, Sep. 20, 1983, 58-173396

Int. Cl.[4] A61K *7/09, 7/11, 7/35*

U.S. Cl. 424—71 **3 Claims**

1. In an aqueous neutralizer for cold waving comprising 0.5% to 20% by weight of (i) an oxidizing agent, the improvement which comprises incorporating, into the neutralizer, 0.0001% to 5.0% by weight of (ii) at least one compound selected from the group consisting of dibenzyl ketone, p-diacetyl benzene, 2-hydroxy-1,4-naphthoquinone, hinokitiol, shikonin, benzyl acetophenone, p-nitroacetophenone, p-hydroxyacetophenone, benzophenone, 2,5-dihydroxy-1,4-benzoquinone, 2-cyclohexenone, and ethyllevulinate.

4,560,555

REACTIVE POLYMERS FOR DERMAL AND TRANSDERMAL THERAPY

Bruno Snider, Capiago Intimiano, Italy, assignor to Sogimi s.r.l., Fino Mornasco, Italy

Filed Dec. 12, 1983, Ser. No. 560,867

Claims priority, application Italy, Dec. 17, 1982, 24839 A/82

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—78 **7 Claims**

1. A method of treating the human or animal skin comprising forming in situ a polymer film chemically bound to said skin, said film being obtained by coating the skin with a dressing selected from liquid isocyanate prepolymers alone or mixed with prepolymers having free hydroxy, amino or amido groups, together with additives, adjuvants, solvents and transcutaneously acting drugs which are not adversely affected by said liquid isocyanate prepolymers and said prepolymers having free hydroxy, amino or amido groups.

4,560,556

FIBRONECTIN-PHYSIOLOGICALLY ACTIVE SUBSTANCE COMPLEX AND METHOD OF PREPARATION THEREOF

Yoshio Kagitani, Kashihara; Kenji Tanaka, Yamatokoriyama; Yasuo Ueda, Hirakata; Yusei Shiraga, Kobe; Tunetaka Nakajima, Kashiwara; Takuji Doi, Kyoto; Takao Ohmura, Toyonaka, all of Japan; Satoshi Funakoshi, Los Angeles, Calif., and Tadakazu Suyama, Kyoto, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jan. 23, 1984, Ser. No. 572,750
Claims priority, application Japan, Jan. 21, 1983, 58-8912
Int. Cl.[4] C07G *7/00*; A61K *35/16, 37/04*
U.S. Cl. 424—101 7 Claims

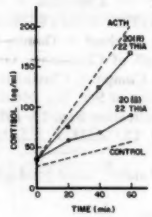
1. A method of preparing a fibronectin-drug complex in which fibronectin is connected directly or through a protein cross-linking agent with a drug, the drug being selected from the group consisting of an antitumor agent, an antibacterial and an anti-inflammatory agent, and having a non-peptide group capable of combining with a protein, which method comprises reacting fibronectin, a protein cross-linking agent and said drug having a non-peptide group capable of combining with a protein.

4,560,557

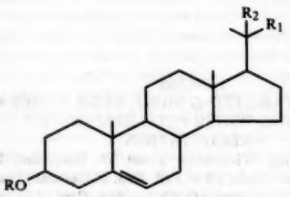
SILICON AND SULFUR STEROIDS AS IRREVERSIBLE INHIBITORS OF HORMONE BIOSYNTHESIS

Stephen R. Wilson, Chatham, N.J.; W. Orme-Johnson, Cambridge, and A. Nagahisa, Jamaica Plain, both of Mass., assignors to University Patents, Inc., Westport, Conn.

Filed Nov. 10, 1983, Ser. No. 550,676
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—178 8 Claims



1. A method of irreversible inhibition of the enzymatic conversion of cholesterol to steriod hormones which comprises inactivating the P-450scc enzyme responsible for conversion of cholesterol to progesterone with a compound of the formula:



wherein R is hydrogen, CH_3, $PO(O^-)_2$, or other protecting group; R_2 is hydrogen or hydroxy; R_1 is —S—R_3 or —$CH_2CH_2Si(Ry)_3$ wherein R_3 is a C_{1-6} straight chain alkyl, a C_{1-6} straight chain alkylene, or a C_{3-6} branched chain alkyl or akylene, and wherein Ry is hydrogen, hydroxyl, C_{1-6} branched or straight chain alkyl, or mixtures thereof.

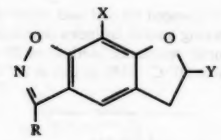
4,560,558

3-ALKYL-8-CHLORO-5,6-DIHYDROFURO-[3,2-f]-1,2-BENZISOXAZOLE-6-CARBOXYLIC ACIDS

James A. Parks, North Chicago, and Jacob J. Plattner, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 16, 1983, Ser. No. 494,751
Int. Cl.[4] C07D *261/20*; A61K *31/42*
U.S. Cl. 514—379 18 Claims

1. A compound of the formula:



wherein X is hydrogen, loweralkyl, loweralkoxy or halo, Y is carboxyl, carboxamido or carboloweralkoxy, and R is cyclohexyl, or loweralkyl, or a pharmaceutically acceptable salt thereof.

4,560,559

YEAST-RAISABLE WHEAT-BASED FOOD PRODUCTS THAT EXHIBIT REDUCED DETERIORATION IN PALATABILITY UPON EXPOSURE TO MICROWAVE ENERGY

Ray Ottenberg, Washington, D.C., assignor to Lee Ottenberg, Bethesda, Md., a part interest

Continuation-in-part of Ser. No. 407,621, Aug. 12, 1982, Pat. No. 4,463,020. This application Jun. 3, 1983, Ser. No. 500,829
The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.
Int. Cl.[4] A21D *8/00, 13/00*
U.S. Cl. 426—19 38 Claims

17. A method of making a yeast-raised wheat-based food product comprising the steps of:

preparing a formulation comprising wheat flour, yeast, and an effective amount of at least one starch of average cystal size less than about 20 microns to reduce deterioration in the platability of the food product upon heating by microwave energy;

mixing the formulation into a dough; and

baking the dough formulation for a time and at a temperature sufficient to form a yeast-raised wheat-based food product; and heating the food product by exposing it to microwave energy.

4,560,560

METHOD OF MAKING CHEESE LIKE FOOD

Hiroki Narimatsu; Kenshi Sakamoto, both of Sennan; Tomoko Edayoshi, Izumisano, and Hayato Kubota, Izumi, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 409,962, Aug. 20, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 627,505
Int. Cl.[4] A23C *19/02*
U.S. Cl. 426—38 7 Claims

1. In a method of making an unripened cheese-like food comprising mixing a proteinaceous component and a fat or oil component, curdling the resulting mixture with a microorganism, an enzyme or a mixture of a microorganism and an enzyme to form a curd, cooking the curd to separate whey, draining the whey, adding salt, (and then working up the resulting material and pasteurizing the unripened cheese-like food, the improvement which comprises using as the fat or oil component a fat or oil selected from the group consisting of

(a) rapeseed oil,

(b) a mixture of rapeseed oil and 5 to 50%, based on the weight of said mixture, of a laurin fat or oil which is a

member selected from the group consisting of coconut oil, palm kernel oil, babassu oil and a mixture thereof,

(c) a mixture of 30% by weight or more, based on the weight of the mixture, of rapeseed oil, 5 to 50% by weight, based on the weight of the mixture, of said laurin fat or oil and another edible fat or oil which is a member selected from the group consisting of soy bean oil, palm oil, tallow, lard, sheep fat, fish oil, whale oil, linseed oil, peanut oil, rice bran oil, safflower oil, sunflower oil, cottonseed oil, kapok oil, olive oil, shea butter, sal fat, illipe butter and a mixture thereof, and

(d) a mixture of rapeseed oil and said other edible oil,

said fat or oil having a solid fat index determined by a pulse nuclear magnetic resonance method of 20 to 55% at 10° C., 10 to 45% at 20° C., 25% or less at 30° C. and 10% or less at 35° C.

4,560,561

POULTRY FEED SUPPLEMENT AND METHOD OF MAKING

Charles J. Henderson, Nipomo, and Gerald L. Cotton, Santa Maria, both of Calif., assignors to Betteravia Byproducts Co., Santa Maria, Calif.

Filed Mar. 19, 1984, Ser. No. 591,017

Int. Cl.⁴ A23K *1/02*

U.S. Cl. 426—74 **24 Claims**

1. An improved poultry feed supplement for improving the shell strength of eggs, said supplement being dried pellets consisting of:

(a) about 80–97%, on a dry weight basis, waste lime from a sugar refining process, said waste lime containing about 78–85% on a dry weight basis of calcium carbonate particles at least 83% of which are less than about 74 microns in diameter, and non-sugar organic particles; and

(b) a nutritive agglomerating constituent selected from the group consisting of beet molasses, cane molasses, wood molasses, citrus molasses, corn steep liquor, invert sugar solutions and mixtures thereof, said pellets having a moisture content of about 0–5 weight percent, whereby the rate of absorption and extent of use of said calcium carbonate in said waste lime by poultry are improved in order to provide stronger egg shells.

4,560,562

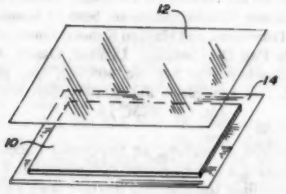
MARSHMALLOW SHEET AND PACKAGING ARRANGEMENT

John E. Schroeder, P.O. Box 2684 Gravois Station, St. Louis, Mo. 63116

Filed Nov. 7, 1984, Ser. No. 669,013

Int. Cl.⁴ A23G *3/00*; A23P *1/08*; B65D *81/00, 85/00*

U.S. Cl. 426—87 **9 Claims**



1. A combination of a thin sheet of expanded confectionary marshmallow food product, enclosed and sealed in first and second pieces of plastic film joined together at their corresponding edges, the first piece of film being transparent to allow visual inspection, of the enclosed marshmallow sheet, the second piece of film being frosted sufficient to allow creative tracings and markings to be made thereon by a marker for prospective cutouts to be made out of the marshmallow sheet.

4,560,563

COMPOSITE ICE CONFECTIONS AND PROCESSES FOR PREPARING THEM

David Tresser, Bedford, England, assignor to Thomas J. Lipton, Inc., Engelwood Cliffs, N.J.

Continuation of Ser. No. 319,623, Nov. 9, 1981, abandoned, which is a continuation of Ser. No. 225,365, Jan. 15, 1981, abandoned, which is a continuation of Ser. No. 197,993, Nov. 20, 1980, abandoned, which is a continuation of Ser. No. 127,154, Mar. 4, 1980, abandoned. This application Apr. 5, 1983, Ser. No. 481,270

Claims priority, application United Kingdom, Mar. 2, 1979, 7907523; Jul. 20, 1979, 7925448

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.⁴ A23G *9/04, 9/24*

U.S. Cl. 426—101 **18 Claims**

1. A frozen ice confection product which comprises an ice confection in contact with a layer of fat-based confectionery coating said coating having at 40° C. a viscosity η_3 of at least 25 poise; η_{100} of at least 2.0 poise and η_{CA} at least 2.2 poise and comprising flavoring and sweetening solids suspended in 30–70% by weight of a fat component, which fat component has a solid content index in the following ranges:

70–93% at −20° C;
65–93% at −10° C.;
55–90% at 0° C.;
15–40% at 20° C.;
0–12% at 30° C.;
0% at 40° C.;

a slip melting point in the range of 23° C. to 32° C.; and at 40° C. a viscosity η_{100} of at least 35 centipoise, and a η_{CA} of at least 30 centipoise.

4,560,564

TEXTURED PROTEIN TOMATO SAUCE PRODUCTS

David J. Bruno, Jr.; Michael J. Dodds; Debra L. Fuqua, and John E. Hunter, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 546,675, Oct. 28, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 652,163

Int. Cl.⁴ A23L *1/275, 1/39*

U.S. Cl. 426—250 **28 Claims**

1. An edible, shelf-stable sauce product comprising:

(a) tomatoes;

(b) textured protein;

(c) seasonings and spices; and

(d) having a pH of from about 4.0 to about 6.0

wherein upon separation of the textured protein, the screened sauce has a color at 70° F. (21° C.) of from about 20.5 to about 25 Hunter "L" units, from about 18.5 to about 25 Hunter "a" units, and from about 11.5 to about 15 Hunter "b" units.

4,560,565

METHOD OF STABILIZING MUST, STILL WINES AND SPARKLING WINES WITH RESPECT TO PRECIPITATION

Karl Wucherpfennig, Wiesbaden; Ernst W. Bott, and Peter Schottler, both of Oelde, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,158

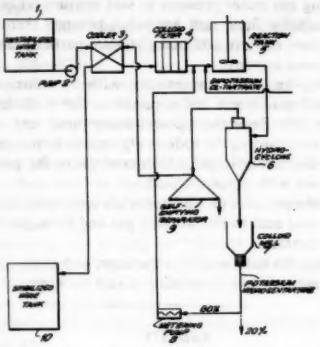
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244221

Int. Cl.⁴ C12H *1/02*; C12G *1/00, 1/02, 1/06*

U.S. Cl. 426—330.4 **7 Claims**

1. A method of stabilizing the liquid products must, still wines and sparkling wines with respect to crystalline precipita-

tion comprising; adding seed crystals of potassium hydrogentartrate and 0.25 to 1.0 g/l of dipotassium DL-tartrate to said



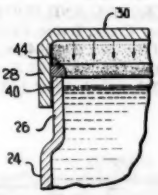
liquid products during processing of said liquid products to accelerate crystal growth.

4,560,566

METHOD OF HOT FILLING AND CLOSING A CONTAINER

Donald J. Roth, Westport, Conn., assignor to Continental Packaging Company, Inc., Stamford, Conn.

Filed Jan. 4, 1984, Ser. No. 568,008
Int. Cl.⁴ B65B *7/28, 55/06, 31/00*
U.S. Cl. 426—399 **7 Claims**



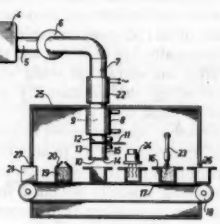
1. A method of controlling the pressure while a can which is filled with a hot product and closed while said product is still hot; said method comprising the steps of providing a can having a free end defining an open mouth, filling the can through the open mouth with the hot product, providing an end unit for the open mouth having an end panel and a depending skirt portion of a size to be telescoped over said open mouth in close fitting relation, applying to the interior of the skirt an annular bead of adhesive which is in a flowable state, telescoping the skirt over the can open mouth until an air tight seal is formed between the end unit and said can when the adhesive bead comes into contact with the free end defining the can open mouth, then further telescoping the end unit relative to the can to reduce the volume defined by the end unit and the can and thus effect a controlled pressurization of the interior of the can while the adhesive flows between the interior of the end unit skirt and an exterior of the can to maintain the seal between the end unit and the can, and permitting the adhesive to set and form a permanent connection between the end unit and the can.

4,560,567

METHOD FOR THE PREPARATION AND PACKING OF FOOD PRODUCTS, IN PARTICULAR FISH PRODUCTS, OF LONG KEEPING QUALITY

Hans A. Rausing, Lund, Sweden, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Continuation of Ser. No. 315,544, Oct. 27, 1981, abandoned.
This application Apr. 30, 1984, Ser. No. 604,448
Claims priority, application Sweden, Oct. 30, 1980, 8007631
Int. Cl.⁴ A23L *3/22, 3/00;* **B65B** *55/04, 55/12*
U.S. Cl. 426—399 **3 Claims**



1. A method for the continuous preparation and packing of fish or meat food products, comprising the sequential steps of:

grinding said food product;

sterilizing said food product;

imparting a desired outer shape to said food product by continuously urging the food product through an internally sterile filling and forming pipe having a cross-section of a packing container provided with closable flap sections;

compressing the food product in the pipe;

thickening said compressd food product by passing the food product through a cooling section of the pipe;

advancing said compressed and thickened food product toward an opening of said filling and forming pipe;

closing said opening of said filling and forming pipe by swinging two flap portions attached to said filling and forming pipe toward each other;

cutting off a predetermined length of said compressed and thickened food product in said pipe and above said opening to form a food product portion having a size and a shape corresponding to a storage area defined by the packing container while simultaneously temporarily shutting off the continuous flow of the remainder of said compressed and thickened food product in the pipe to said opening of said filling and forming pipe;

advancing the packing container through a plurality of stations in indexed steps;

sterilizing the storage area of said container at one of said plurality of stations;

opening said filling and forming pipe by swinging said two flap portions away from each other;

depositing said food product portion into said container at another one of said plurality of stations;

closing said opening of said filling and forming pipe by swinging the two flap portions toward each other while sumultaneously allowing the flow of the remainder of the compressed and thickened food product in the pipe to continue to the opening of the filling and forming pipe;

closing said container under aseptic conditions, after said food product is deposited therein; and

repeating said sequential steps to aseptically package a plurality of said food product portions.

4,560,568

PROCESS FOR THE RECOVERY OF OIL FROM AVOCADO FRUIT

Maurice Curiel, 40 Nitzanim St., Neve-Oz, Petach-Tiqvah, Israel

Filed Jan. 20, 1984, Ser. No. 572,314
Claims priority, application Israel, Jan. 9, 1984, 67843
Int. Cl.[4] A23L *1/28*
U.S. Cl. 426—417 13 Claims

12. A process for the recovery of oil and unsaponifiable matter from avocado fruit by extraction, comprising the steps of: (a) comminuting fresh avocado fruit; (b) extracting the comminuted, fresh avocado fruit with a miscella of acetone and avocado oil at a temperature of from about 10° C. to about 25° C., said temperature resulting in the extraction of substantially all the water in the fruit and simultaneously minimizing the coextraction of oil and unsaponifiable matter, the extracted fruit being substantially free of water, and the water content in the miscella after the extraction being above about 5% by weight; (c) extracting the substantially water-free avocado fruit in sequential steps with a plurality of acetone solutions containing decreasing concentrations of avocado oil, and at a temperature of from about 40° C. to about 55° C., the last step being the extraction of the fruit with pure acetone; (d) cooling the water-containing miscella obtained from extracting the fresh avocado fruit to ambient temperature to effect a two-phase separation; and (e) separating an upper phase of oil-acetone-water containing most of the unsaponifiable matter, from a lower phase of oil-acetone-water containing the main fraction of avocado oil.

4,560,569

FORMULATION OF DOUGH-BASED FRIED SNACK FOODS

John T. Ivers, Lewisville, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Feb. 24, 1984, Ser. No. 583,222
Int. Cl.[4] A21D *2/32*
U.S. Cl. 426—549 9 Claims

1. In a process for the preparation of a comestible product which includes the steps of:

(a) preparing a dough of pregelatinized starch, a dry flaked or powdered cereal or flakes of a starchy vegetable, vegetable oil, water, sugar and salt;

(b) sheeting the dough;

(c) cutting the sheeted dough to produce a shaped chip;

(d) frying the shaped chip in fat or oil; and

(e) seasoning the fried product,

the improvements in the process comprising; forming a suspension of lecithin in water, the amount of lecithin being at least 0.02% of the weight of the pregelatinized starch and dry flaked or powdered cereal or flakes of starchy vegetable, and less than an amount in which the sheeted dough becomes lacy and breakage occurs, and adding the lecithin suspension to the dough prior to the sheeting of the dough.

4,560,570

METHOD FOR THE PREPARATION OF A POROUS, SOLID OR SEMISOLID FOOD PRODUCT BASED ON GROUND FISH OR MEAT RAW MATERIALS

Hans Rausing, Wadhurst Park, England, and Marita Rausér, Lund, Sweden, assignors to Tetra Pak Development SA, Pully, Switzerland

Filed May 22, 1984, Ser. No. 613,022
Claims priority, application Sweden, Jun. 1, 1983, 8303100
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—564 8 Claims

1. A method for preparing a porous, solid or semi-solid food product containing ground fish or meat materials comprising:

grinding said materials to form a mixture;

adding sodium alginate and a calcium compound to said mixture;

heat treating said mixture;

introducing gas under pressure to said mixture while it is at least partially fluid, said gas being pumped through the pressurized mixture and being at least partially dissolved in the same mixture;

introducing an acid concurrently with or subsequent to introducing said gas under pressure, the acid liberating calcium ions from the calcium compound, said calcium ions in turn causing the sodium alginate to form a non-reversible thermostable gel which confers on the product a solid form with porous structure;

reducing the pressure on said materials approximately when adding said acid to liberate said gas and form gas bubbles in said mixture;

introducing the mixture into a package; and then

allowing said mixture to solidify in said package.

4,560,571

PROCESS FOR THE PREPARATION OF INSTANT COFFEE OR THE LIKE

Jinichi Sato; Toshiro Kurusu; Naoyoshi Kondo, all of Iwakura, and Makoto Tamaki, Komaki, all of Japan, assignors to Sato Shokuhin Kogyo Kabushiki Kaisha, Komaki, Japan

Continuation-in-part of Ser. No. 285,034, Jul. 20, 1981, abandoned. This application Aug. 10, 1982, Ser. No. 407,241
Claims priority, application Japan, Aug. 9, 1980, 55-109477; Jan. 19, 1981, 56-004962
Int. Cl.[4] A23F *5/26, 5/44*
U.S. Cl. 426—594 2 Claims

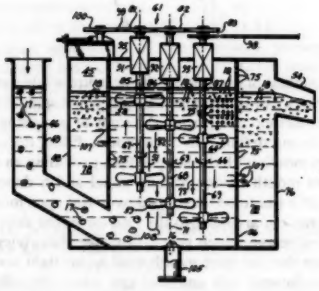
1. A process for the preparation of instant beverages, which comprises extracting one part by weight of one member selected from the group consisting of roasted coffee beans and roasted cereals with 2 to 30 parts by weight of an aqueous solution containing cyclic dextrin having a cyclic dextrin content of 1.5 to 6%, and spray-drying the extract.

4,560,572

CITRUS FRUIT PROCESSING AND FOOD PRODUCT

Sharkey Watanabe, 31 Deer Creek, Irvine, Calif. 92714

Continuation-in-part of Ser. No. 294,104, Aug. 19, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,599
Int. Cl.[4] A23L *1/212;* A23P *1/00*
U.S. Cl. 426—616 8 Claims



1. In a method of processing exposed clusters of juice-bearing citrus fruit vesicles, the improvement comprising in combination the steps of:

forming a slurry including said clusters; and

propelling said slurry in countervailing first and second streams until said clusters are broken up into discrete juice-bearing vesicles.

4,560,573

RYE FLAVORING

Albert Spiel, Yonkers, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 9, 1983, Ser. No. 493,090
Int. Cl.[4] A23L 1/22
U.S. Cl. 426—622 38 Claims

1. A method of making a lump free, dry rye flavoring having between 40–88% rye flour, 4–15% liquid acid flavorings and 8–45% dry flavorings by weight totaling 100% of the rye flavoring comprising:

(a) premixing dry components, the dry components are the rye flour and the dry flavorings;

(b) blending separately from the dry components the liquid acid flavorings;

(c) spraying and mixing the blended liquid acid flavorings into the dry components to form an elastic composition;

(d) allowing the resultant elastic composition to set and dry into a hard consistency;

(e) grinding the resultant hard composition into a dry powder; and

(f) mixing the dry powder composition to achieve a uniform rye flavoring powder.

19. A method of making a lump free, dry rye flavoring comprising 40–88% rye flour, 4–15% liquid acid flavorings and 8–45% dry flavorings by weight totaling 100% of the rye flavoring comprising:

(a) premixing dry components of 10–60% of the rye flour with the dry flavorings;

(b) blending separately from the dry components the liquid acid flavorings;

(c) spraying and mixing the blended liquid acid flavorings into the dry components to form a composition;

(d) grinding to a coarse state the resultant composition and dusting simultaneously the ground composition with the remaining rye flour;

(e) allowing the ground, dusted composition to set and dry into a hard consistency;

(f) grinding the composition of step (e) into a dry fine powder; and

(g) mixing the composition to achieve a uniform rye flavoring powder.

4,560,574

SALT SUBSTITUTE CONTAINING POTASSIUM CHLORIDE, MALTODEXTRIN AND SODIUM CHLORIDE AND METHOD OF PREPARATION

David R. Meyer, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,849
Int. Cl.[4] A23L 1/237
U.S. Cl. 426—649 32 Claims

1. A salt substitute composition which comprises a uniform admixture comprising as particulate components thereof:

(a) potassium chloride,

(b) maltodextrin and

(c) sodium chloride,

wherein (i) said components are present in the percentage amounts set forth:

potassium chloride: from about 91 to about 19%,

maltodextrin: from about 1 to about 40%, and

sodium chloride: from about 0.1 to about 75%,

the percentage amounts being by weight based on the combined weight of said components, and the (ii) dextrose equivalent (D.E.) value of the combined amount of potassium chloride, maltodextrin and sodium chloride is not more than 10 D.E. units.

4,560,575

METHOD FOR COATING A NUCLEAR FUEL WITH BORON NITRIDE

Larry R. Eisenstatt, Orchard Park, N.Y., and Kenneth C. Radford, Irwin, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,057
Int. Cl.[4] G21C 3/06
U.S. Cl. 427—6 12 Claims

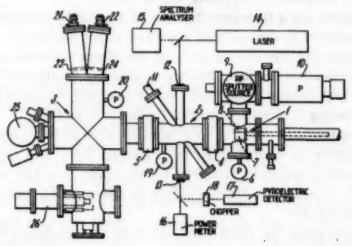
1. A method of applying a burnable absorber coating on nuclear fuel comprising uranium dioxide comprising the step of exposing said nuclear fuel in a reaction chamber to a gas stream of boron trichloride and anhydrous ammonia at a temperature of from about 600°–800° C. whereby a coating of boron nitride is formed as a reaction product on said fuel.

4,560,576

METHOD OF COATING OPTICAL COMPONENTS

Keith L. Lewis, and James A. Savage, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 6, 1984, Ser. No. 668,818
Claims priority, application United Kingdom, Nov. 11, 1983, 8330126
Int. Cl.[4] G02B 1/10
U.S. Cl. 427—38 9 Claims



1. A method of coating optical component substrate comprising the steps of arranging the substrate in a vacuum chamber, cleaning the component whilst holding the pressure below 10^{-4} millibar and the partial pressure of H_2O and carbonaceous gases below 4.10^{-9} mb, applying at least one layer of a coating material to the substrate, whilst holding the pressure below 10^{-8} and the partial pressure of H_2O and carbonaceous gases below 4.10^{-9} mb.

4,560,577

OXIDATION PROTECTION COATINGS FOR POLYMERS

Michael J. Mirtich, North Olmsted; James S. Sovey, Strongsville, and Bruce A. Banks, Olmsted Township, Cuyahoga County, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 11, 1984, Ser. No. 649,330
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 6 Claims

1. A method of protecting a polymeric material from oxidation comprising the steps of

mounting said material in a vacuum environment,

exposing said material to a beam of ions in said vacuum environment thereby cleaning absorbed gases and contaminants from a surface of said material, and

mounting a sputter target having a metal oxide portion and a polymer portion in said ion beam for simultaneous co-sputtering thereby sputter coating said cleaned surface in said vacuum environment immediately after cleaning with

a continuous thin film comprising a metal oxide and a polymer in a predetermined ratio to form an oxidation barrier.

4,560,578

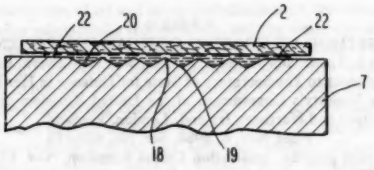
METHOD AND APPARATUS FOR SURFACE REPLICATION ON A COATED SHEET MATERIAL

Eben W. Freeman, Portland, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 320,771, Nov. 12, 1981, abandoned. This application Jul. 3, 1984, Ser. No. 627,388

Int. Cl.⁴ B05D *3/06, 5/00;* **B05C** *11/02*

U.S. Cl. 427—44 **9 Claims**



1. A method of providing surface replication in a coating on a sheet material, comprising the steps of:

A. applying a flowable coating of a settable composition or material to one side of a web of sheet material;

B. pressing the coated side of the sheet material against a replicative surface having a desired contoured surface effect having peaks and valleys to cause the surface of the coating to conform to the replicative surface;

C. setting the coating to a nonflowable state at least sufficiently to enable it to be removed from the replicative surface securely attached to the sheet material and with the replicated surface effect in the coating being maintained; and

D. stripping the sheet material from the replicative surface with the at least partially set coating adhered to the sheet material,

characterized by the replicative surface comprising a cylinder having the desired surface effect in the central portion of its outer cylindrical surface, said surface effect extending laterally less than the width of the sheet material on both sides and being bordered on both sides by cylindrical bands of a smooth surface extending beyond the width of the sheet material and having a diameter no less than the diameter of the valleys of the contoured surface effect area, and the coating extending laterally into the area of the smooth surface bands, whereby the set coating material fills all of the desired surface effect area and is stripped cleanly from the replicative surface and the smooth surface bands.

6. An apparatus for providing surface replication in a settable coating on a sheet material, comprising:

A. a replicative surface having a desired contoured surface effect of peaks and valleys and being provided by a cylindrical surface mounted for revolution;

B. coating means for applying a coating of a settable composition or material directly to one side and short of either edge of the sheet material;

C. pressing means for pressing the coated side of the sheet material against the replicative surface to cause the surface of the coating opposite the sheet material to conform to the replicative surface.

D. means for setting the coating to a nonflowable state at least sufficiently to enable it to be removed from the replicative surface securely attached to the sheet material and with the replicated surface effect in the coating being maintained; and

E. means for stripping the sheet material from the replicative surface with the at least partially cured coating adhered to the sheet material,

characterized by the replicative surface comprising a cylinder having the desired surface effect in the central portion of its outer cylindrical surface, said surface effect extending laterally less than the width of the sheet material on both sides and being bordered on both sides by cylindrical bands of a smooth surface extending beyond the width of the sheet material and having a diameter no less than the diameter of the valleys of the contoured surface effect area, whereby the set coating material can fill all of the desired surface effect area and extend laterally into the area of the smooth surface bands and can be stripped cleanly from the replicative surface and the smooth surface bands.

4,560,579

PROCESS FOR COATING OF SUBSTRATES WITH HEAT CURABLE COATING

Bahram Siadat, Boxborough, Mass., and Charles R. Morgan, Brookeville, Md., assignors to W. R. Grace & Co., New York, N.Y.

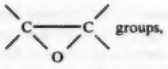
Division of Ser. No. 487,682, Apr. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 317,672, Nov. 2, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,544

Int. Cl.⁴ B05D *3/02*

U.S. Cl. 427—45.1 **7 Claims**

1. A process for forming a coating on a substrate which comprises admixing a heat curable composition comprising

(1) an epoxy resin containing at least two



groups,

(2) a thermal initiator selected from the group consisting of diaryliodonium salts and diaryliodonium salts in combination with a pinacol, and

(3) a thermoplastic adhesive material selected from the group consisting of polyesters, polyvinyl acetals, polyamides, butadiene-acrylonitrile copolymers, styrene-butadiene copolymers, styrene-isoprene copolymers, styrene-ethylene-butylene copolymers, ethylene-vinyl acetate copolymers, ethylene-ethyl acrylate copolymers, and mixtures thereof,

coating said admixture on a substrate and heating said coating in the range 70°–200° C. to effect curing.

4,560,580

PROCESS FOR ENCAPSULATING ARTICLES WITH OPTIONAL LASER PRINTING

Donald G. Needham, and John E. Leland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 429,738, Sep. 30, 1982, Pat. No. 4,443,571. This application Mar. 19, 1984, Ser. No. 590,824

Int. Cl.⁴ B05D *3/06, 5/12*

U.S. Cl. 427—53.1 **5 Claims**

1. Process to encapsulate articles comprising

(a) melting a composition comprising polyarylene sulfide and at least one print compound selected from the group consisting of

monoazo-nickel complex
lead chromate-lead molybdate
quinacridone
nickel-antimony-titanium
cobalt-zinc-silica and
lead chromate

(b) injecting the so molten composition around the article to be encapsulated,

(c) cooling the composition surrounding the article to be encapsulated, and solidifying said molten composition to form said encapsulated article.

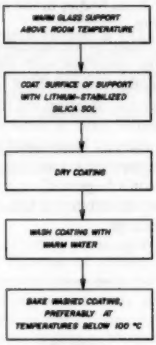
4. Process in accordance with claim 1 further comprising subjecting the surface of the solidified encapsulating material to a pattern of laser light irradiation such as to modify the surface of the composition in all the areas exposed to said laser light.

4,560,581

METHOD FOR PREPARING LITHIUM-SILICATE GLARE-REDUCING COATING

Samuel B. Deal, Lancaster, and Donald W. Bartch, Wrightsville, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 15, 1985, Ser. No. 723,151
Int. Cl.[4] H01J *31/00;* **B05D** *5/02;* **C03C** *17/22*
U.S. Cl. 427—64 **11 Claims**


WARM GLASS SUPPORT ABOVE ROOM TEMPERATURE
COAT SURFACE OF SUPPORT WITH LITHIUM-STABILIZED SILICA SOL
DRY COATING
WASH COATING WITH WARM WATER
BAKE WASHED COATING, PREFERABLY AT TEMPERATURES BELOW 100 °C

1. A method for preparing an optical viewing screen having a glare-reducing viewing surface comprising

(a) warming a glass support to temperatures above room temperature,

(b) coating a surface of said warm support with an aqueous solution containing lithium-stabilized silica sol, and drying the deposited coating,

(c) washing said dry coating with water,

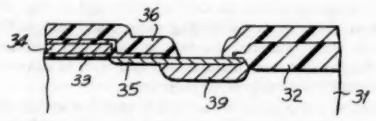
(d) and then, subsequent to said washing step (c), baking said washed coating.

4,560,582

METHOD OF PREPARING A SEMICONDUCTOR DEVICE

Matsuo Ichikawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 322,307, Nov. 17, 1981, abandoned. This application Jun. 7, 1984, Ser. No. 618,174
Claims priority, application Japan, Nov. 20, 1980, 55-163564
Int. Cl.[4] H01L *21/38*
U.S. Cl. 427—88 **5 Claims**



1. A method for forming a semiconductor device including an MOS field effect transistor on a single crystal silicon substrate, comprising the steps of:

forming a field oxide film on a single crystal silicon substrate with a region free of the field oxide film;

forming a gate oxide film on the region of the substrate free of the field oxide film;

depositing a gate electrode on a portion of the gate oxide film spaced apart from the field oxide film;

forming a thin oxide film on the gate electrode and the region between the gate and field oxide film;

diffusing ions into the surface of the substrate at the region between the gate and the field oxide film for forming a first N^+ diffused source and/or drain regions;

forming a contact hole in the thin oxide film in the opening;

depositing a second insulating film on the surface of the thin oxide film and field oxide film;

diffusing a second atom into the surface of the substrate at the contact hole for forming a second diffused region overlapping the first diffused region and to a greater depth than the first diffused region; and

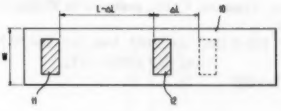
forming a metal connector at the contact hole.

4,560,583

RESISTOR DESIGN SYSTEM

Tor W. Moksvold, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,189
Int. Cl.[4] H01L *21/66*
U.S. Cl. 427—88 **13 Claims**



1. A method of making a precision integrated resistor having a predetermined design resistance R and length L on a semiconductor body, said method comprising the steps of:

(a) introducing dopant in selected regions of the semiconductor body to form a resistor pattern including a device resistor body of a predetermined shape and a test resistor structure having a predetermined design sheet resistance;

(b) measuring the sheet resistance of the test resistor structure and determining the difference $\Delta\rho_s$ between the measured sheet resistance and said predetermined design sheet resistance;

(c) calculating by utilizing $\Delta\rho_s$, the adjustment in length ΔL to said design length L necessary to obtain a resistor whose resistance corresponds to said design resistance R and obtaining a new length $L \pm \Delta L$; and

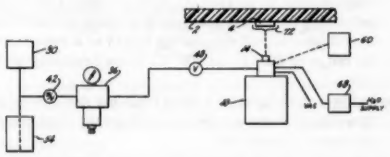
(d) forming a pair of metal contacts contacting said device resistor body at a separation corresponding to said new length.

4,560,584

METHOD AND APPARATUS FOR APPLYING SOLDER MASKING TO A CIRCUIT BOARD

Albert S. Henninger, Castle Creek, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Dec. 23, 1983, Ser. No. 564,829
Int. Cl.[4] H05K *3/28*
U.S. Cl. 427—96 **14 Claims**



1. A method of applying temporary viscous solder resist material to a circuit board and masking selected portions

thereof from subsequent solder applying, and comprising the steps of:

providing a gun for projecting shots of said resist material from a tip of said gun;

positioning said tip and circuit board relative to and spaced from each other such that said tip is generally oppositely spaced from a selected portion of said circuit board; and

projecting a shot of said resist material onto said selected portion and masking said selected portion from subsequently applied solder.

4,560,585

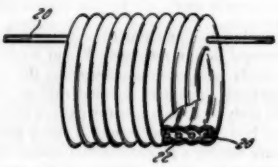
POISON RESISTANT COMBUSTIBLE GAS SENSOR

Gul Khilnani, Fremont, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Dec. 23, 1983, Ser. No. 564,982

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 427—103 **6 Claims**



1. A method for producing a poison resistant active element for a combustible gas sensor comprising the steps of:

forming a filament of electrically conductive material having a resistance which varies with temperature into a helical coil;

coating said helical coil with a refractory material and heating said refractory material until sintering takes place to produce a dense gas-tight sheath;

applying a first layer in liquid mixture form of a combination ceramic material and catalytically active material to said sheath on the helical coil;

curing said first layer at a temperature in the range of 800° C. to 1100° C. from 2 minutes to 3 minutes;

applying a plurality of alternating layers in liquid mixture form of a non-catalytic ceramix material and a catalytically active material to said first cured layer on said helical coil;

curing the non-catalytic ceramic liquid mixture material of said plurality of alternating layers at a temperature in the range of 800° C. to 1100° C. from 2 minutes to 3 minutes, and curing the catalytically active liquid mixture material of said plurality of alternating layers at a temperature in the range of 800° C. to 900° C. from 2 minutes to 3 minutes;

applying a final layer of a liquid mixture containing aluminum chloride and aluminum oxide to the final one of the alternating layers; and

curing said mixture layer of aluminum chloride and aluminum oxide at a temperature in the range of 800° C. to 1100° C. from 2 minutes to 3 minutes to form a cured final layer of non-catalytic porous aluminum oxide.

4,560,586

PROCESS OF DEBURRING MOLDINGS MADE FROM GRANULAR MATERIAL

Hans Tölle, Wuppertal; Karl Frech, and Hartmut Lüdke, both of Lippstadt, all of Fed. Rep. of Germany, assignors to Carl Kurt Walther GmbH & Co. KG, Wuppertal and Theodor Heimeier Metallwerk GmbH, Erwitte, both of, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,987

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1982, 3201284

Int. Cl.⁴ B29C *1/04*

U.S. Cl. 427—134 **23 Claims**

1. A process for deburring fragile moldings made of granular material comprising the steps of

adding hard-foam bodies to abrasive bodies to form a mixture defining an abrasive body medium having a proportion of the hard-foam bodies in the abrasive body medium of more than 50%,

deburring the moldings by abrasive action by vibration and circulation of the moldings with the abrasive body medium along a helical path within an abrasive finishing vibrator machine by vibrating the machine,

said hard-foam bodies have a density substantially lower than that of the abrasive bodies, and have such a degree of hardness that an impression can be made on the hard-foam bodies by a person's fingernail,

and wherein during the deburring step, the hard-foam bodies cushion the moldings.

4,560,587

PROCESS OF MAKING LOW-PROFILE TRANSFER ARTICLE

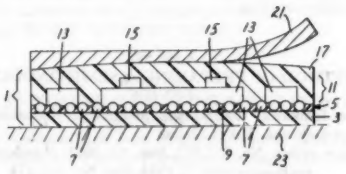
Makoto Sasaki, Mishimia, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 467,435, Feb. 17, 1983, Pat. No. 4,514,457. This application Jan. 14, 1985, Ser. No. 690,891

Claims priority, application Japan, Feb. 19, 1982, 57-25688

Int. Cl.⁴ B41M *5/00*; B44C *1/16*

U.S. Cl. 427—152 **4 Claims**



1. A method of making a transfer article comprising:

(1) providing a surface of a sheet material with a layer of adhesive, said layer of adhesive having a free surface and an opposing surface in contact with said surface of said sheet material, said opposing surface and said surface of said sheet material having an adhesion relationship whereby said sheet material and said layer of adhesive are manually separable from each other;

(2) applying a coating of particles to said free surface of said layer of adhesive, said particles being adhereably bonded to said adhesive and aggregately providing a substrate defined by free particle surface which is printable with liquid ink;

(3) applying at least one layer of liquid ink to said substrate coating of particles; and

(4) solidifying said ink to provide a predetermined graphic design defined by said ink.

4,560,588

METHOD OF CONSOLIDATING SAND

Hans W. Nethe, Amsterdam, Netherlands, and Frank R. Nethe, Rehovot, Israel, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,286

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329913

Int. Cl.[4] C05F *11/08;* A01B *79/00;* A01C *1/00;* B05D *7/00*

U.S. Cl. 427—215 14 Claims

1. A method of consolidating and stabilizing sand, consisting essentially of impregnating sand with an aqueous dispersion of pyrogenically produced silicon dioxide and/or corresponding mixed oxides of silicon, to thereby enable better retention of plant roots in the sand.

4,560,589

METHOD FOR PROVIDING A COATING LAYER OF SILICON CARBIDE ON SUBSTRATE SURFACE

Morinobu Endou, Nagano; Minoru Takamizawa, Tokyo; Tatsuhiko Hongu, Kanagawa, and Taishi Kobayashi, Niigata, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,649

Claims priority, application Japan, Sep. 22, 1982, 57-165498; Nov. 8, 1982, 57-195702

Int. Cl.[4] C23C *11/00, 13/00*

U.S. Cl. 427—249 3 Claims

1. A method for providing a coating layer of silicon carbide on the surface of a filament of carbon in a sheath-and-core manner which comprises pyrolyzing the vapor of a vaporizable organosilicon compound having at least one hydrogen atom directly bonded to the silicon atom in a molecule but having no halogen atom or oxygen atom directly bonded to the silicon atom at a temperature in the range from 700° to 1400° C. in contact with the surface of the carbon filament to deposit silicon carbide thereon, wherein the organosilicon compound is a silane or polysilane compound represented by the general formula $R_{2n+2}Si_n$, in which R is a hydrogen atom or a monovalent hydrocarbon group, at least one but not all of the groups denoted by R in a molecule being a hydrogen atom, and n is a positive integer of 1 to 4 inclusive.

4,560,590

METHOD FOR APPLYING A COATING ON A SUBSTRATE

Edward Bok, Burg. Amersfoordtlaan 82, 1171 Dr Badhoevedorp, Netherlands

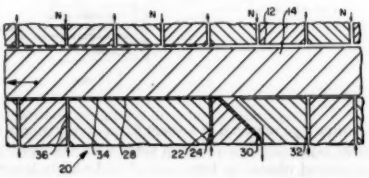
PCT No. PCT/NL83/00006, § 371 Date Oct. 24, 1983, § 102(e) Date Oct. 24, 1983, PCT Pub. No. WO83/02910, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 21, 1983, Ser. No. 551,992

Claims priority, application Netherlands, Feb. 24, 1982, 8200753

Int. Cl.[4] B05D *3/00*

U.S. Cl. 427—294 16 Claims



1. Method for applying a coating upon a substrate comprising:

a. flowing gaseous medium longitudinally within a confined passageway via a series of gaseous medium supply channels and vacuum discharge channels intersecting said passageway;

b. introducing the substrate into an end of said passageway, so as to be supported and advanced, while being cushioned, by said flowing gaseous medium; while

c. injecting a pressurized coating medium into said passageway via a series of branched medium supply channels intersecting said passageway adjacent said gaseous medium supply channels and gaseous medium discharge channels, so as to fill locally the longitudinal passageway; while

d. restricting flowing of coating medium within said passageway by reducing the height of said passageway.

4,560,591

APPARATUS FOR AND METHOD OF SPRAYING FOR FORMING REFRACTORIES

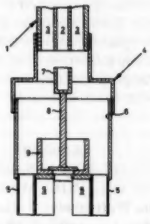
Robert Plumat, Mons; Pierre Robyn, Nivelles, and Pierre Deschepper, Charleroi, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Jul. 13, 1984, Ser. No. 630,395

Claims priority, application United Kingdom, Jul. 30, 1983, 8320631

Int. Cl.[4] B05D *1/12*

U.S. Cl. 427—422 24 Claims



4. A method of spraying particulate refractory-forming combustible material, particulate refractory material and a comburent gas against a surface so that on combustion a coherent refractory mass is formed on such surface, comprising: using a lance having a lance head with a plurality of spray nozzles and having at least one feed passage along which the material to be sprayed is conveyed to said lance head whence the material is ejected through said plurality of spray nozzles, said material moving through said lance head along a flow path from an upstream to an downstream position; controlling said flow path to provide at least one location at which the material undergoes a change in direction as it flows along the flow path; and catching particulate material conveyed along said flow path by locating a cup-like recess at each said at least one location so that the material caught itself forms a barrier against abrasion at the location of said recess.

4,560,592

METHOD OF AND APPARATUS FOR DIP COATING

Anthony E. Friedland, Apple Valley, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 6, 1985, Ser. No. 709,240

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—430.1 4 Claims

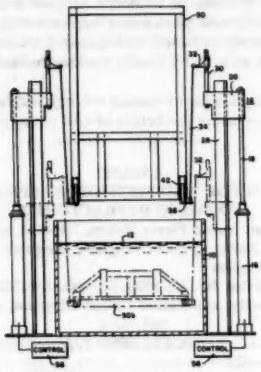
1. The method of dip coating in a coating immersion tank a frame-like object having hollow cavity sections and/or corner spaces formed by members of the frame oriented in different planes, comprising:

supporting said object by attaching the object at points spaced around its periphery at at least three locations above said tank with the major dimension of said object in a horizontal disposition;

lowering said object into said tank to a level at which said object is totally immersed;

successively changing the relative elevation of at least one said point relative to the elevation of at least two other said points in a sequence in which all said points are successively so relatively elevated so that the object will have been relatively tilted about at least three different axes through said object to insure a complete coating of all said members and the movement thereof and/or purging of air from all entrapping cavities and/or corners; and then,

raising said object from said tank.



4,560,593
DEPOSITION OF METALS ON ELECTRICALLY CONDUCTIVE, POLYMERIC CARRIERS

Herbert Naarmann, Wattenheim; Volker Münch, Ludwigshafen, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 401,348, Jul. 23, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,546

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132218

Int. Cl.⁴ C23C *3/02*

U.S. Cl. 427—443.1 **5 Claims**

1. A process for depositing a metal having a standard potential E_o of $>-2V$ onto an electrically conductive polymeric carrier having the formula:

$$[M''y\ (P)]_x \qquad II$$

where M'' is Li, Na, K, Rb or Cs, where P is —CH—, —C_6H_4—, —C_4—H_2S—, —C_6—H_4S—, —C_4H_2O—, —C_4H_2NH—, —C_6H_4O—, or —C_5H_3N—, y is a numeral from 0.001 to 0.6 and x is a numeral from 5 to 1000; or the formula:

$$[(P)\ (X)_y]_x \qquad III$$

where P is as identified in the above formula II, X is ClO_4, AsF_6, PF_6, SbF_6, BF_4, HSO_4, CF_3SO_3, or Br, y is a numeral from 0.001 to 0.6 and x is a numeral from 5 to 1000; from a solution of a metal cation compound by reduction of the metal cation dissolved in an aprotic polar or nonpolar solvent, said metal cation being selected from the group consisting of Au^+, Au^{+++}, Pt^{++}, Pd^{++}, Ag^+, Hg^{++}, Hg_2^{++}, Cu^+, Cu^{++}, Re^{+++}, Bi^{+++}, Fe^{+++}, Pb^{++}, Ni^{++}, Co^{++}, Fe^{++}, Zn^{++}, and Mn^{++}, the anion of the metal cation compound being selected from the group consisting of F^-, Cl^-, Br^-, I^-, CN^-, NO_3^-, CH_3COO^-, $CH_3SO_3^-$, $H_3PO_2^-$ and ClO_4^-, said metal cation compound optionally containing a substituent selected from the group consisting of RCN where R is an alkyl, cycloalkyl or aryl of from 1–6 carbon atoms, $OPR^1R^2R^3$ where R^1, R^2 and R^3 are the same or different with each being selected from the group consisting of an alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy or aryloxy of from 1–6 carbon atoms, pyridyl, hexamethylphosphoramide, NH_3 and CO, and where P is defined as in the formula II.

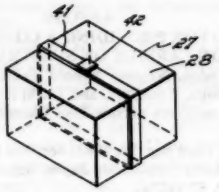
4,560,594
METHOD FOR FORMING ADHESIVE BOND AND A LIQUID CRYSTAL ADHESIVE

Walter H. Cobbs, Jr., Amherst, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Mar. 12, 1982, Ser. No. 357,691

Int. Cl.⁴ C09K *3/34;* **B32B** *3/00, 27/14;* **B05D** *5/00*

U.S. Cl. 428—1 **6 Claims**



1. A method of strapping one or more articles comprising heating a thermoplastic, polymeric, thermotropic, nematic liquid crystalline material at least to the C-N point of said polymeric material and applying a molten strip of said material onto the surface of said one or more articles completely around the periodic of said one or more articles to form a contnuous strip of material, applying an orienting force to said polymeric material while said material is still in a molten state.

5. An article strapped according to the method of claim 1.

4,560,595
THERMAL/OPTICAL CAMOUFLAGE WITH CONTROLLED HEAT EMISSION

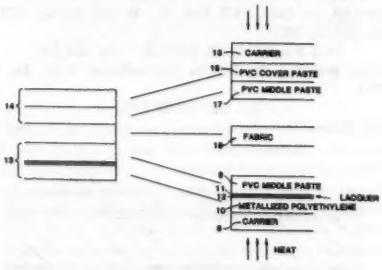
Lars E. Johansson, Ottawa, Canada, assignor to Diab-Barracuda AB, Laholm, Sweden

Filed Mar. 22, 1984, Ser. No. 592,237

Claims priority, application Sweden, Mar. 25, 1983, 8301666

Int. Cl.⁴ F41H *3/00*

U.S. Cl. 428—17 **19 Claims**



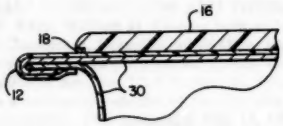
1. Camouflage material in a sheet form comprising a reflecting metal layer covered on both sides with layers of camouflage-coloured plastic, at least one of said plastic layers comprising a plastic material which is highly transparent to thermal infrared waves and which together with said reflecting layer has a given emissivity, characterized in that a surface of said camouflage material includes a second plastic layer body having together with said reflecting layer an emissivity differing from that of said give emissivity.

4,560,596

DECORATIVE TRIM STRIPS AND PROCESS FOR MAKING THE SAME

Charles M. Coscia, Upper Arlington, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed May 21, 1984, Ser. No. 612,515
Int. Cl.[4] B60R 13/04
U.S. Cl. 428—31 18 Claims



1. A decorative trim strip to overlay a specified area of the surface of an article to be decorated and consisting essentially of:

(a) a generally rectangularly shaped decorative foil member having a length longer than the surface to be decorated, a lower surface, and an upper surface provided with a decoration,

(b) a partial central section of the upper surface of said foil member bearing a weather-resistant and impact-resistant plastic overlay having radiused edges and providing a lens effect to said decoration,

(c) end sections of the upper surface of said foil member on each side of said partial central section having no overlay thereon, and

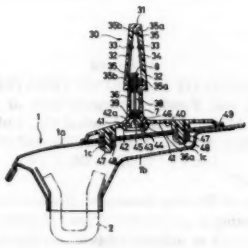
(d) the plastic overlaid partial central section of said foil member being essentially coextensive with the length of the surface of the article to be decorated and the end sections which are not overlaid with said plastic overlay serving as one means for securing said trim strip to the intended surface.

4,560,597

COLLAPSIBLE ORNAMENT STRUCTURE

Hiroshi Kanamori, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 27, 1984, Ser. No. 635,143
Claims priority, application Japan, Aug. 5, 1983, 58-144109
Int. Cl.[4] B60R 13/04
U.S. Cl. 428—31 8 Claims



1. A collapsible ornament on a hood comprising:

a base which is fixed to an outer panel of the hood;

an ornament body which is rockably mounted on said base, said ornament body including a part for supporting a decorative laminated sheet, and a hollow cylindrical shaft one end of which is connected to the supporting part and the other end of which is in contact with said base;

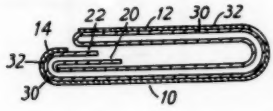
collapsible means for rockably holding said ornament body in a predetermined position, said collapsible means being provided inside the hollow cylindrical shaft of said ornament body and located totally outside the outer panel, after the base with the ornament body including the collapsible means are fixed to the outer panel.

4,560,598

PLASTICS FILM AND BAGS AND SACKS THEREFROM

Michael A. Cowan, Much Hadham, England, assignor to Stiksack STS S.A., Geneva, Switzerland

Continuation of Ser. No. 494,559, May 13, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,601
Claims priority, application United Kingdom, May 20, 1982, 8214701; Jun. 3, 1982, 8216239; Jul. 21, 1982, 8221127; Dec. 3, 1982, 8234566
Int. Cl.[4] B65D 65/28; B32B 27/08
U.S. Cl. 428—35 19 Claims



1. A thermoplastics sack or bag at least one of the walls of which has an outer layer and an inner layer, each of which is formed by melt-extrusion from a polymer composition selected from the group consisting of (a) at least one polyethylene selected from the group consisting of homopolymers of ethylene and copolymers of ethylene with up to 5 mole % of at least one other α-olefin and (b) blends of at least one said polyethylene with minor proportions of other polymeric materials compatible therewith, and the outer layer contains an isobutylene polymer in an amount sufficient to increase the coefficient of friction, and wherein the surface of said inner layer has a lower coefficient of friction than that of said outer layer.

4,560,599

ASSEMBLING MULTILAYERS OF POLYMERIZABLE SURFACTANT ON A SURFACE OF A SOLID MATERIAL

Steven L. Regen, Milwaukee, Wis., assignor to Marquette University, Milwaukee, Wis.

Continuation-in-part of Ser. No. 579,386, Feb. 13, 1984, abandoned. This application Jan. 28, 1985, Ser. No. 695,483
Int. Cl.[4] B05D 3/06
U.S. Cl. 428—36 76 Claims

1. A method for the stepwise coating of a solid substrate with a polyfunctional polymerizable surfactant to provide a multilayer assembly on a surface of the solid substrate comprising depositing and polymerizing sequential layers of polymerizable surfactant on said substrate or coated substrate from a polymerization system comprising:

(a) a polyfunctional polymerizable surfactant in an aqueous or polar solvent system; and

(b) a polyfunctional polymerizable surfactant in non-polar organic solvent system;

wherein the sequential coatings are alternately effected from the (a) and (b) polymerization systems and the polymerizable surfactant utilized is the same or different for each sequential coating.

58. A multilayered surfactant coated solid substrate prepared as in claim 1 having a patterned coating of polymerized surfactant thereon.

4,560,600

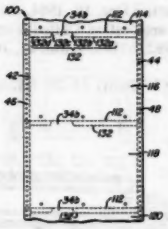
CONTINUOUS FORMS FOR MAKING INDEXES

Jacob A. Yellin, 405 Davis Ct. 908, San Francisco, Calif. 94111, and Richard N. Koss, 2130 Cedar St., San Carlos, Calif. 94070

Filed Oct. 4, 1984, Ser. No. 658,141
Int. Cl.[4] B32B 3/24; B42F 21/12
U.S. Cl. 428—43 14 Claims

1. A continuous form for making one or more index sheets

comprising an elongated strip of material perforated along a first line or a first set of lines transverse to the length of the strip, so that when the strip is split along the first line or first set of lines, a plurality of individual sheets are obtained, wherein at least one sheet is perforated along a second line which is so positioned on such sheet that when said at least one sheet is split along the second line, an index sheet of predetermined shape is obtained, said second line being adjacent and substantially parallel to one side of such sheet, said second line of perforation traversing the length or width of such sheet except for a predetermined portion, said second line of perforation being connected to such one side by one or more additional lines of perforation near the edges of the portion, so that when such sheet is split along said second line and said additional lines of perforation, an index sheet with said portion forming an index tab will result.



4,560,601

HIGH-DENSITY INFORMATION DISC LUBRICANTS

Pabitra Datta, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1984, Ser. No. 636,310
Int. Cl.[4] G11B *3/70*; B32B *3/02*
U.S. Cl. 428—64 **5 Claims**

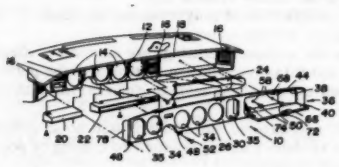
1. In a capacitance electronic disc having a lubricant film thereon, the improvement which comprises adding to the lubricant an effective amount of a donor-acceptor complex wherein the donor is polyphenylene ether to reduce moisture sensitivity.

4,560,602

VEHICLE INSTRUMENT PANEL APPLIQUE WITH GLOVE BOX

David L. Draper, Hamburg, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed Nov. 8, 1984, Ser. No. 669,465
Int. Cl.[4] B44C *5/04*
U.S. Cl. 428—79 **9 Claims**



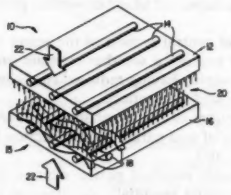
1. An applique for a vehicle instrument panel having a driver side with gauges and a passenger side without any glove box, said applique comprising: a cover including driver and passenger portions respectively located at the driver and passenger sides of the instrument panel; each cover portion having an inner side that faces the instrument panel upon mounting thereon and also having an outer side that faces the vehicle occupant compartment; openings in the driver portion of the cover through which the gauges of the instrument panel can be viewed; a glove box on the passenger portion of the cover; said glove box including an opening in the passenger portion of the cover and also including a door mounted for movement between open and closed positions with respect to the glove box opening; the glove box further including a receptacle panel on the inner side of the passenger portion of the cover in alignment with the opening thereof to define a glove box receptacle; and means for mounting the driver and passenger portions of the cover on the instrument panel.

4,560,603

COMPOSITE MATRIX WITH ORIENTED WHISKERS

Jeffrey A. Giacomel, Arlington, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Oct. 27, 1983, Ser. No. 546,091
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—86 **18 Claims**



13. A high strength laminated composite structural material comprising:

at least two fiber element layers disposed in parallel overlapping relationship within a surrounding matrix; and

whiskers of a selected material adapted to be responsive to an applied shaped electromagnetic field and spaced between said fiber element layers in said matrix, said whiskers having a selected orientation in said matrix from said shaped field effective to directionally enhance strength and integrity of said laminated material.

4,560,604

METHOD OF FLOCKING TREATMENT

Goro Shimizu, and Yosuke Kitagawa, both of Ohtsu, Japan, assignors to Matsui Shikiso Chemical Co., Ltd., Japan

Filed Aug. 22, 1984, Ser. No. 643,054
Int. Cl.[4] B05D *1/06, 1/14*
U.S. Cl. 428—87 **2 Claims**

1. A method of flocking treatment characterized by entirely or partially coating a surface of a shaped material of a synthetic resin or fibers with an adhesive having incorporated therein a thermally color-changeable particulate material, the particulate material comprising three components enclosed in a high-molecular-weight compound, the three components being an electron donating chromogenic substance, an electron accepting substance corresponding to the chromogenic substance and a solvent having a boiling point of at least 150° C. and selected from the group consisting of alcohols, amides, esters and azomethines; and electrostatically flocking the resulting adhesive layer with colored or colorless short fibers.

2. A material treated by the method defined in claim 1 which is useful for making stuffed toys.

4,560,605

Patent Not Issued For This Number

4,560,606

BASALT COMPOSITIONS AND THEIR FIBERS

Charles F. Rapp; William H. Fausey, both of Newark, and J. Ronald Gonterman, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 321,873, Nov. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 200,178, Oct. 24, 1980, abandoned. This application Feb. 14, 1985, Ser. No. 701,489

Int. Cl.⁴ C03B *37/02, 37/06;* **C03C** *13/00;* **C04B** *43/02*

U.S. Cl. 428—141 **25 Claims**

1. High softening basalt fibers produced from 95 to 60% by weight natural basalt rock modified with 5.0 to 40.0 weight percent of an additive consisting essentially of only at least one alkaline earth metal oxide wherein the basalt fibers have a composition containing at least 12 weight percent CaO and 15 weight percent or less of MgO,

wherein the composition has a viscosity of log n=1.0 at a temperature of 2950° F. or less.

16. Ceiling tile or boards produced from the fibers of claim 1.

22. A method of producing mineral wool comprising the steps of:

a. providing a raw material consisting essentially of 60–95% by weight natural basalt rock modified with 5 to 40 weight percent of an additive consisting essentially of only at least one alkaline earth metal oxide wherein the basalt fibers have a composition containing at least 12 weight percent CaO and 15 weight percent or less of MgO;

b. melting the raw material;

c. forming the molten raw material into fibers;

d. cooling the fibers; and

e. collecting the cooled fibers

wherein the composition has a viscosity of log n=1.0 at a temperature of 2950° F. or less, and

wherein the fibers have a high softening temperature as indicated by a viscosity of log n=11.0.

4,560,607

METHOD OF JOINING MATERIALS BY MECHANICAL INTERLOCK AND ARTICLE

Earl C. Sumner, Tipp City, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Jun. 7, 1984, Ser. No. 618,422

Int. Cl.⁴ B32B *3/10, 7/04, 31/00*

U.S. Cl. 428—141 **24 Claims**

15. A layered article of manufacture comprising:

a first layer of thermally formable polymeric material;

a second layer of a different material overlying the first layer; and

chips of thermally formable polymeric material embedded within and fused to the first layer such that the chips partially protrude therefrom and provide surfaces which

overhang the first layer so as to form a mechanical interlock between the first and second layers to hold the first and second layers together.

4,560,608

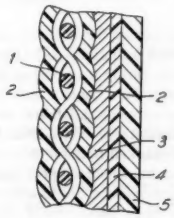
WINTER CAMOUFLAGE MATERIAL

Gunter Pusch, Bannholzweg 12, 6903 Neckargemund 2; Alexander Hoffmann, Mauer, and Dieter E. Aisslinger, Geisenheim, all of Fed. Rep. of Germany, assignors to Gunter Pusch, Neckargemund, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 459,354, Dec. 16, 1982, Pat. No. 4,495,239, which is a continuation-in-part of Ser. No. 226,787, Jan. 21, 1981, Pat. No. 4,473,826. This application Jun. 20, 1984, Ser. No. 622,731

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—196 **9 Claims**



1. A winter camouflage material comprising a base layer of woven or non-woven fabric coated on both sides with a plastic material; a reflecting metal layer having a specific surface resistivity of 0.5 to 1.5 ohms per square, wherein the metal is selected from the group consisting of aluminum, tin and gold; and a white camouflage paint layer containing a white pigment and a binder which has high transparency in the spectral regions of atmospheric windows II (3–5 μm) and III (8–15 μm),

said camouflage material having a reflection coefficient in the far infrared region of the spectrum of about 0.5 to 0.7.

4,560,609
PLASTIC FILM

Nobuo Fukushima, Sakamoto Honmachi; Shuji Kitamura, Ibaraki; Kiyohiko Nakae, Nishinomiya; Kozo Kotani, Toyonaka; Takayuki Terazawa, Shiga, and Toyoaki Nakarai, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

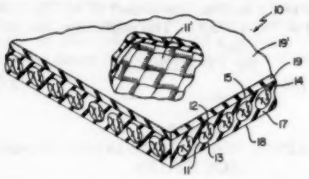
Division of Ser. No. 457,153, Jan. 11, 1983, Pat. No. 4,542,061. This application Jun. 25, 1985, Ser. No. 748,384
Claims priority, application Japan, Jan. 27, 1982, 57-12129
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—220 **6 Claims**

1. An infrared radiation absorbing film composed of 100 weight parts of an olefin resin (A) and 2 to 25 weight parts of an amorphous hydrated aluminosilicate gel (B), wherein the ratio of the refractive index n_A of the olefin resin to the refractive index n_B of the amorphous hydrated aluminosilicate gel, (n_A/n_B), is within the range of from 0.99 to 1.02.

4,560,610
POLYMERIC-COATED FABRIC LAYER

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 482,364, Apr. 5, 1983, Pat. No. 4,474,834. This application Jul. 25, 1984, Ser. No. 634,322
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—246 **6 Claims**

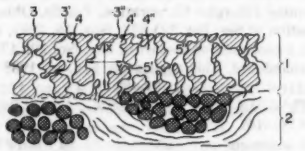


1. In a polymeric-coated fabric layer means having opposed surfaces one of which is adapted to be secured to a surface of a polymeric product during heat curing thereof and the other of which is adapted to be a contact face for said product, said fabric layer means comprising a fabric layer having opposed sides, and two substantially continuous layers of polymeric material secured in stacked relation to one of said sides of said fabric layer by the intermediate polymeric layer first being coated in liquid form onto the fabric layer and when the intermediate layer has been substantially dried without curing thereof the outer polymeric layer is then coated in liquid form onto the intermediate polymeric layer and then substantially dried without curing said polymeric layers whereby the outer layer of polymeric material defines said one surface of said layer means, the improvement wherein only the intermediate polymeric layer of said two polymeric layers has a slip agent therein that during said heat curing will migrate through said outer polymeric layer to the outer surface thereof to provide a degree of reduction in the surface coefficient of friction for said contact face of said product, the slip agent having been contained in said intermediate layer at the time the same was coated in liquid form onto said one side of said fabric layer.

4,560,611
MOISTURE-PERMEABLE WATERPROOF COATED FABRIC

Yasushi Naka, Hirakata, and Kiyoshi Kawakami, Kyoto, both of Japan, assignors to Toray Industries, Incorporated, Japan

Division of Ser. No. 286,615, Jul. 24, 1981, Pat. No. 4,429,000, which is a continuation of Ser. No. 102,410, Dec. 11, 1979, abandoned. This application Oct. 28, 1983, Ser. No. 546,287
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—266 **1 Claim**



1. A moisture-permeable waterproof coated fabric comprising a base fabric and a microporous layer of a synthetic polymer consisting essentially of polyurethane formed on at least one face of said base fabric characterized in that said microporous layer being provided therewithin with cavity portions communicating with fine pores having diameters not larger than 5 microns formed on the surface of said microporous layer, the void portions of said cavity portions having diameters at least three times as large as the diameters of said fine pores and further characterized in that the inner wall of said respective cavity is covered with water repellent agent and at least a part of said inner wall is provided at least a communication hole on it to communicate between adjacent cavities, said microporous layer being formed from a coating solution of a polar organic solvent containing 8 to 25% by weight of a polyurethane elastomer, 0.1 to 10% by weight of a water repellent agent, 0.2 to 3% by weight of polyisocyanate and 1 to 8% by weight of a nonionic surfactant.

4,560,612
MAT BINDERS

Ben J. Yau, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 16, 1984, Ser. No. 610,902
Int. Cl.[4] D04H *1/58, 1/64;* **B32B** *27/00, 5/16*
U.S. Cl. 428—288 **3 Claims**

1. A glass mat formed by glass fibers having on their surface a binder composition consisting essentially of a urea-formaldehyde resin, a styrene-butadiene latex copolymer and a fully methylated melamine-formaldehyde copolymer.

4,560,613
COMPOSITE MATERIAL

Jean-Paul Ollivier, Paris, and Bernard Vinatier, Coye La Foret, both of France, assignors to Atochem, France

Filed Jun. 7, 1984, Ser. No. 618,063
Claims priority, application France, Jun. 24, 1983, 83 10486
Int. Cl.[4] B32B *3/06, 7/10*
U.S. Cl. 428—309.9 **3 Claims**

1. A composite material comprising at least one external layer of a thermosetting polymer, a layer of lightened thermoplastic polymer, and a intermediate layered blend between and homogeneous with said layers over the entire interface of said layers; said intermediate layered blend formed by polymerizing a monomer which is a diluent for said thermosetting polymer and a solvent for said thermoplastic polymer as the external thermosetting polymer is being cross-linked to form the composite.

4,560,614

NON-BLOCKING OPAQUE FILM

Hee C. Park, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,780
Int. Cl.[4] B32B 3/00, 7/04, 27/18
U.S. Cl. 428—317.9 6 Claims

3. An opaque biaxially oriented polypropylene film structure comprising

a core polypropylene matrix within which are located strata of voids;

positioned at least substantially within at least a substantial number of each of said voids, is at least one spherical void-initiating solid particle which is phase distinct and incompatible with said matrix material, the void-space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void; and

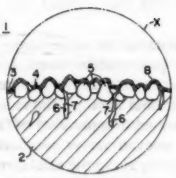
void-free polypropylene skin layers adhering to the surfaces of said core layer, the surfaces of said skin layers having been treated to enhance wettability, said skin layers containing sufficient talc to prevent film-to-film blocking of the film structure after wettability of the surfaces thereof has been enhanced.

4,560,615

ALKALI-PROOF CAST ALUMINUM PRODUCT HAVING A WEAR-RESISTANT SURFACE LAYER

Yu Saito, Kobe, and Tsuneo Harada, Sakai, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Daiwa Alloy Mfg. Co., Osaka, both of, Japan

Filed May 10, 1984, Ser. No. 608,880
Claims priority, application Japan, May 13, 1983, 58-84634
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—328 18 Claims



1. An alkali-proof cast aluminum having a wear-resistant surface layer thereon comprising:

a base material containing aluminum as the main component, said base material having cavities extending to the surface thereof;

a plurality of wear-resistant granules embedded in and partially projecting from said base material;

a first alkali-resistant material in said cavities; and

a second alkali-resistant material forming a coating covering the outer surfaces of said granules and said base material.

4,560,616

MAGNETIC RECORDING MEDIUM HAVING BINDER CURED BY ELECTRON BEAM RADIATION

Tsutomu Okita, Kanagawa; Kyoichi Naruo, Shizuoka, and Hiroshi Hashimoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 9, 1983, Ser. No. 521,797
Claims priority, application Japan, Aug. 10, 1982, 57-138981
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—423.1 14 Claims

1. A magnetic recording medium comprising a support having coated thereon a magnetic layer containing ferromagnetic particles dispersed in a binder, said binder comprising

a vinyl chloride-vinyl acetate type copolymer selected from the group consisting of vinyl chloride-vinyl acetate-vinyl alcohol copolymers having a vinyl alcohol content of 1 to 15 wt % and vinyl chloride-vinyl acetate-maleic acid copolymers having a maleic acid content of 1 to 10 wt %;

a urethane resin; and

a compound having two or more acryloyl groups or methacryloyl group,

wherein the copolymer and the urethane resin are each present in an amount in the range of 20 to 80 parts by weight and the compound is present in an amount in the range of 50 to 400 parts by weight based on 100 parts by weight of the mixture of the copolymer and the urethane resin,

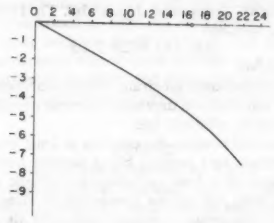
further wherein the binder composition is cured by electron beam radiation.

4,560,617

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu; Yuichi Kubota; Kazunori Tamazaki, and Shigeru Shimada, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,903
Claims priority, application Japan, Mar. 25, 1983, 58-50795
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—423.1 6 Claims



1. A magnetic recording medium comprising fine ferromagnetic particles as the main component and a binder composed of a mixture of a radiation sensitive resin, a radiation sensitive modified resin and a partially saponified vinyl chloride-vinyl acetate copolymer containing at least 0.5% by weight of maleic acid, said binder being cross-liked and polymerized by radiation.

4,560,618

BUILDING/VAPOR BARRIER COMBINATION

Jagadish C. Goswami, New York, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 196,886, Oct. 14, 1980, abandoned, Continuation of Ser. No. 957,389, Nov. 3, 1978, abandoned. This application Aug. 12, 1982, Ser. No. 407,376
The portion of the term of this patent subsequent to Apr. 3, 1996, has been disclaimed.
Int. Cl.[4] E04B 5/00, 2/00; B32B 27/00; C08F 230/02
U.S. Cl. 428—500 6 Claims

1. In combination, a building and a vapor barrier film containing a polymeric component therein, the vapor barrier film being useful in retarding the transmission of water vapor therethrough and comprising an internally plasticized vinyl chloride copolymer resin as the predominant ingredient in the polymeric component of the vapor barrier film, said vinyl chloride copolymer resin also containing a C_6–C_{10} alkyl acrylate and a bis(hydrocarbyl)vinyl phosphonate.

4,560,619

WOOD IMPROVER AND A METHOD OF IMPROVING THE QUALITY OF WOOD

Yasutsugu Yamada, Sapporo, Japan, assignor to Nippon Tensaiseito Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,486
Claims priority, application Japan, Sep. 18, 1982, 57-161592
Int. Cl.[4] B05D *1/02, 1/18;* C08L *97/02*
U.S. Cl. 428—541 15 Claims

1. A method of improving the quality of wood which comprises allowing wood to adsorb an improver comprising waste liquor from the digestion of pulp.

2. A method as set forth in claim 1, wherein said improver is placed in contact with said wood by coating or impregnation by a method selected from the group consisting of spraying, bath immersion, diffusion and injection.

15. An improved wooden product, said product comprising a wooden product which has been treated with an improver comprising waste liquor from the digestion of pulp.

4,560,620

SELF-CLEANING COATING COMPOSITIONS AND COOKING APPARATUS COATED THEREWITH

Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 433,525, Oct. 8, 1982, Pat. No. 4,504,717, which is a division of Ser. No. 229,522, Jan. 30, 1981, Pat. No. 4,374,754, which is a continuation-in-part of Ser. No. 057,106, Jul. 12, 1979, abandoned. This application Dec. 19, 1984, Ser. No. 683,644
Claims priority, application Japan, Jul. 17, 1978, 53-87424; Jul. 27, 1978, 53-92388
Int. Cl.[4] B22F *7/08*
U.S. Cl. 428—565 22 Claims

1. A heat-stable coated substrate which catalytically oxidizes and removes fats and oils deposited thereon comprising:

(a) a heat-stable substrate and

(b) a carbonized coating disposed on at least one surface of said substrate said coating being formed from a coating composition of at least one silicone synthetic resin binder selected from the group consisting of straight silicone resins, silicone resins copolymerized with alkyds, silicone resins copolymerized with epoxy, and silicone resins copolymerized with acrylics; an organic solvent; and a thermostable oxidation catalyst mixed within said silicone synthetic resin and said organic solvent.

4,560,621

POROUS METALLIC BODIES

Richard L. Landingham, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 13, 1984, Ser. No. 589,255
Int. Cl.[4] B22F *3/10, 3/16*
U.S. Cl. 428—566 14 Claims

1. A method of making a porous metallic body, comprising:

(a) providing a powdered metal hydride of a particle size of less than about 220 microns in an amount of about 15–60 percent theoretical density in a confining container under vacuum conditions of about 10^{-6} to 10^{-10} Torr;

(b) heating said hydride disposed therein at a rate of about 0.1° C./min. to 1.0° C./min. to a temperature higher than the temperature at which said hydride decomposes to yield hydrogen and metal;

(c) removing hydrogen gas as it is produced from said container at a rate sufficient as to maintain a vacuum of at least about 10^{-2} Torr within said container, said removal of hydrogen gas occurring until substantially all hydrogen is removed from said hydride and only the metal remains within said container;

(d) heating said metal of step (c) to a temperature greater than the temperature obtained in step (b) but less than about $\frac{1}{2}$ to $\frac{3}{4}$ the temperature at which said metal melts, said heating occurring at a rate of about 3°–7° C./min.; and

(e) allowing the product of step (d) to sinter and then cool.

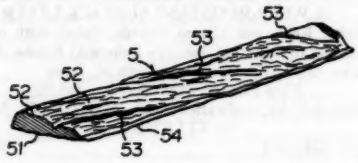
10. A porous metallic body produced according to the method of claim 1.

4,560,622

STEEL FIBER FOR REINFORCING CONCRETE AND PRODUCTION THEREOF

Yoshitomo Tezuka, Hachioji; Takeo Nakagawa, Kawasaki, and Kazusuke Kobayashi, Sagamihara, all of Japan, assignors to Aida Engineering, Ltd., Kanagawa, Japan

Continuation of Ser. No. 325,765, Nov. 30, 1981, abandoned, which is a division of Ser. No. 12,740, Feb. 16, 1979, abandoned. This application Aug. 27, 1984, Ser. No. 644,656
Claims priority, application Japan, Feb. 22, 1978, 53-19259
Int. Cl.[4] C04B *31/18*
U.S. Cl. 428—599 3 Claims



1. A reinforcing material for mixing into concrete to input high strength thereto produced by directly cutting the surface of a steel block using a milling cutter, said material comprising a flat, needle-like steel fiber having a flat face and, opposite the flat face, a surface formed of a plurality of fine wrinkles and a plurality of rugged, uneven waves substantially deeper than the fine wrinkles, running along the axial direction of said fiber on the wrinkled surface, the flat face, and the surface opposite the flat face, when the fiber is viewed in cross-section, forming a long and narrow shape which is tapered toward the flat face, and produced by:

preparing a plain milling cutter having a diameter and teeth with cutting edges, each having a rake angle between 0° and −30° and a twist angle between 0° and 60°, said diameter being greater than 100 mm ϕ;

setting a feed rate S_z mm per tooth of a steel ingot and a depth t of cut per tooth such that any one of S_z and t is more than 0.4 mm, both S_z and t are in the range of 0.1 mm to 2.0 mm, S_z/t is more than 1.0 and S_z times t is 0.1 to 0.5 mm^2; and

machining said ingot material with the cutter rotating such that the teeth at the point of contact are moving in the same direction as the feed of the material, wherein the machine operation is carried out in conditions that if either S_z or t is 0.4 mm, the cutting speed is set at more than 90 m/min, and if either S_z or t is more than 0.9 mm, the cutting speed is set at more than 30 m/min, and if either S_z or t is between 0.4 mm and 0.9 mm, the cutting speed is heightened in proportion to the decreasing value of either S_z or t, whereby needle-like steel fibers are directly produced from the ingot material having wrinkled surfaces formed with a plurality of rugged waves running along an axial direction of the fiber.

4,560,623

SPECULAR PRODUCT OF BRONZE-LIKE TONE

Yoshitaka Iwata, Zama, and Ken Matsuda, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,121
Claims priority, application Japan, May 13, 1983, 58-83715
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—626 14 Claims

1. A specular product of bronze-like tone, consisting essentially of:

a composite board including a synthetic resin sheet and metal sheets laminated on both surfaces of said synthetic resin sheet;

a nickel layer electroplated on at least one of said metal sheets; and

a specular film of Sn-Ni alloy electroplated on said nickel deposit wherein the atomic ratio of Sn in said alloy is in the range of 10–40% and said Sn-Ni alloy has a color described by the parameters of $L^*=60–70$, $a^*=0–3$ and $b^*=7–12$ as defined by the CIE-1976 (L^*, a^*, b^*) color space.

4,560,624

MAGNETIC RECORDING MEDIA WITH A DUAL PROTECTIVE COATING OF SILICON MONOXIDE AND CHROMIUM

Christine Güttner, Heidelberg; Peter Heilmann, Bad Durkheim; Udo Kullmann, Dirmstein, all of Fed. Rep. of Germany; Dieter Mayer, Sudbury, Mass., and Werner Grau, Bobenheim-Roxheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,179
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1983, 3343107
Int. Cl.[4] C03C *29/00*; H01F *10/10*
U.S. Cl. 428—632 3 Claims

1. A magnetic recording medium which possesses, on a dimensionally stable base which may or may not be provided with a non-magnetic lower layer, a thin ferromagnetic metal layer on which a protective layer is applied, wherein the protective layer is in the form of a dual coating of chromium and silicon monoxide.

4,560,625

ALUMINUM ALLOY COMPOSITE MATERIALS FOR BRAZED HEAT EXCHANGERS

Masaharu Kaifu, Shimonoseki; Jun Takigawa, Ohyadaimachi; Hideo Fujimoto, Ohyadaimachi; Tomohiro Nishimura, Ohyadaimachi, and Masao Takemoto, Ohyadaimachi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 8, 1984, Ser. No. 578,094
Claims priority, application Japan, Feb. 14, 1983, 58-23546[U]
Int. Cl.[4] B32B *15/20*
U.S. Cl. 428—654 8 Claims

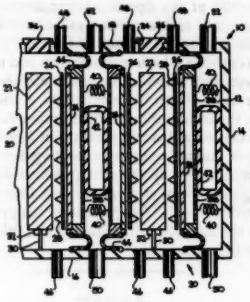
1. An Al alloy composite material for brazed heat exchangers which comprises an Al core alloy essentially consisting of 0.2–1.0 wt% of Si, 0.1–0.5 wt% of Mg, the weight ratio of Si to Mg being in the range of 1–2.5, 0.2–1.0 wt% of Cu, at least one element selected from the group consisting of Mn, Cr and Zr, each contained in an amount of 0.05–0.5 wt%, and the balance being Al and inevitable impurities, and an Al alloy clad layer formed or clad on one side of said core alloy, which side is to be in contact with an aqueous heat transfer medium, said clad layer having a thickness of 3–20% the thickness of said composite material and a less-noble corrosion potential of 20–100 mV than said core alloy.

4,560,626

RAPIDLY REFUELABLE FUEL CELL

Richard W. Joy, Santa Clara, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,053
Int. Cl.[4] H01M *8/02*, *8/18*
U.S. Cl. 429—27 10 Claims



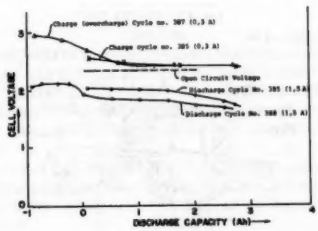
1. A refuelable fuel cell comprising a housing including two opposite walls, an anode support carried by one of said walls within said housing and generally defining the position of an anode within said housing, an anode supply opening in the other of said walls in alignment with said anode support, a pair of cathodes positioned on opposite sides of said anode position for cooperation with an anode to form dual cells, pressure means for separately urging each cathode at a constant force towards said anode position, and means for supplying an electrolyte between each of said cathodes and said anode position.

4,560,627

ELECTROCHEMICAL CELL

Roger J. Bones, Abington, England; Roy C. Galloway; Johan Coetzer, both of Pretoria, South Africa, and David A. Teagle, Swindon, England, assignors to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg

Filed Jul. 18, 1984, Ser. No. 631,905
Claims priority, application United Kingdom, Jul. 22, 1983, 8319749
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—103 14 Claims



1. In an electrochemical cell which comprises a sodium anode which is molten at the operating temperature of the cell, a sodium aluminium halide molten salt electrolyte which contains chloride ions and is molten at the operating temperature of the cell, a cathode which contains iron and is in contact with the electrolyte, and, between the anode and the electrolyte and isolating the anode from the electrolyte, a solid conductor of sodium ions, the iron in the cathode, upon overcharging of the cell, being oxidized at least in part to $FeCl_3$ which is soluble in

the electrolyte, the method of protecting the cell against adverse effects caused by overcharging thereof, which comprises operating the cell connected in parallel with a protective cell having an open circuit charging plateau at a voltage less than the open circuit voltage of the Fe/$FeCl_3$//Na plateau of the cell being protected, and greater than the open circuit voltage, in its fully charged state, of the cell being protected.

9. A battery of electrochemical cells which comprises at least one protected electrochemical cell having a sodium anode which is molten at the operating temperature of the cell, a sodium aluminium halide molten salt electrolyte which contains chloride ions and is molten at the operating temperature of the cell, a cathode which contains iron and is in contact with the electrolyte, and, between the anode and the electrolyte and isolating the anode from the electrolyte, a solid conductor of sodium ions, the iron in the cathode, upon overcharging of the cell, being oxidized at least in part to $FeCl_3$ which is soluble in the electrolyte, and at least one protective electrochemical cell connected in parallel with the protected cell which has an open circuit charging plateau at a voltage less than the open circuit voltage of the Fe/$FeCl_3$//Na plateau of the protected cell, and greater than the open circuit voltage, in its fully charged state, of the cell being protected.

4,560,628

HIGH CAPACITY INORGANIC OXYHALIDE ELECTROCHEMICAL CELL

Charles W. Walker, Jr., Freehold; William L. Wade, Jr., Neptune, both of N.J.; Michael Binder, Brooklyn, N.Y., and Sol Gilman, Rumson, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 21, 1984, Ser. No. 653,116
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—105 **6 Claims**

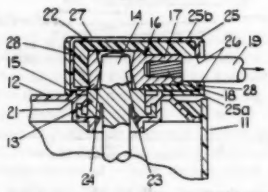
1. A high capacity lithium inorganic oxyhalide electrochemical cell comprising lithium as the anode, carbon as the cathode, and a solution of a quaternary ammonium salt in an inorganic oxyhalide solvent as the electrolyte wherein the quaternary ammonium salt is selected from the group consisting of tetrapropylammoniumtetrachloroaluminate and tetrabutylammoniumtetrachloroaluminate.

4,560,629

ELECTRIC STORAGE BATTERIES

John L. Woodhouse, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 102,309, Dec. 11, 1979, abandoned.
This application Jul. 9, 1981, Ser. No. 281,549
Claims priority, application United Kingdom, Dec. 16, 1978, 48819/78
Int. Cl.[4] H01M *2/08*
U.S. Cl. 429—184 **8 Claims**



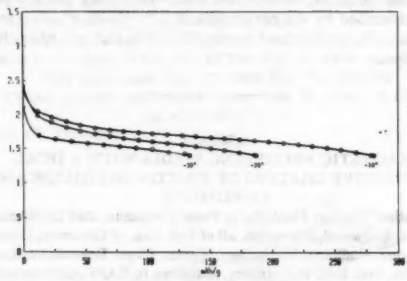
1. A combination of an electric storage battery and a device for making an external electrical connection to the battery, wherein the device includes a conductive member secured to a conductive battery terminal projecting from an external surface of the battery and a conductive cable connected to the conductive member and surrounded by an insulating sheath, and wherein the terminal and the conductive member are encapsulated in an electrically insulating material whereby the terminal is electrically isolated from the surroundings of the battery, said insulating material being substantially self-sealing when punctured by a needle-pointed, electrical testing probe.

4,560,630

RECHARGEABLE LITHIUM CELL HAVING AN ELECTROLYTE COMPRISING 4-BUTYROLACTONE IN DIMETHOXYETHANE

Mark Salomon, Fairhaven, and Edward J. Plichta, Freehold, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 27, 1984, Ser. No. 655,114
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **8 Claims**



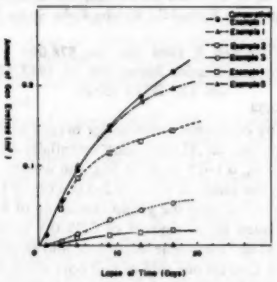
1. A rechargeable lithium cell having an improved low temperature ($-40°$ C.$\leqq t \leqq 0°$ C.) performance and rate capability comprising a lithium anode, a lithium intercalating cathode, and an electrolyte comprising a solution of a lithium salt in 15 to 50 mass percent 4-butyrolactone (4-BL) in dimethoxyethane (DME).

4,560,631

ORGANIC ELECTROLYTE CELLS

Hideki Nishihama, and Kazuhide Miyazaki, both of Takehara, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihombashi, Japan

Filed Oct. 3, 1984, Ser. No. 657,142
Claims priority, application Japan, Dec. 19, 1983, 58-238015
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **3 Claims**



1. An organic electrolyte cell comprising lithium as the anode active material, and copper powder-added manganese dioxide as the cathode active material.

4,560,632

POLYVINYL-COATED CATHODE COLLECTOR FOR CELLS EMPLOYING LIQUID CATHODES

Vicente S. D. Alberto, Parma, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 428,246, Sep. 29, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 637,696

Int. Cl.[4] H01M *4/64, 6/16*

U.S. Cl. 429—196 11 Claims

1. A porous cathode collector for use in a nonaqueous cell employing a liquid cathode-electrolyte solution, said cathode collector comprising a particulate carbonaceous conductive material bonded with a binder being present in an amount less than 15 weight percent based on the weight of the cathode collector and having on at least a part of its surface a coating of a vinyl polymer film to improve its mechanical strength and handling characteristics and wherein said vinyl polymer film is soluble in the liquid cathode-electrolyte solution.

4,560,633

REINFORCED HIGH POLYMERS, PROCESS FOR PREPARING SAME AND BATTERY HAVING SAME

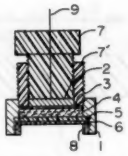
Yukio Kobayashi; Kinya Yamaguchi, both of Tokyo, and Masaaki Kira, Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Hitachi Ltd., both of Tokyo, Japan

Continuation of Ser. No. 619,692, Jun. 13, 1984, abandoned, which is a continuation of Ser. No. 424,445, Sep. 27, 1982, abandoned. This application Feb. 27, 1985, Ser. No. 705,861

Claims priority, application Japan, Sep. 25, 1981, 56-150647; May 27, 1982, 57-88823; May 27, 1982, 57-88824

Int. Cl.[4] H01M *10/36*

U.S. Cl. 429—213 57 Claims



1. A battery comprising a positive electrode, a negative electrode and an electrolyte, wherein at least one of said positive electrode and said negative electrode is comprised of a reinforced acetylene high polymer shaped article, which comprises (1) an acetylene high polymer or an electroconductive acetylene high polymer doped with a dopant, and (2) 10 to 500 parts by weight, per 100 parts by weight of the acetylene high polymer, of the sheet-form product of a fibrous material, and which is prepared by shaping under pressure a swollen or gel-like acetylene high polymer containing an organic solvent, together with said sheet-form product; said sheet-form product being a woven or knitted fabric, a non-woven fabric or a net or screen, which is composed of an organic high polymer fiber or an inorganic fiber, and said acetylene high polymer being prepared by polymerizing acetylene using a catalyst system comprised of a transitional metal compound and an organic metal compound, said transitional metal compound being used in an amount of 0.0001 to 0.1 mole per liter of a polymerization solvent.

4,560,634

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING MICROCRYSTALLINE SILICON

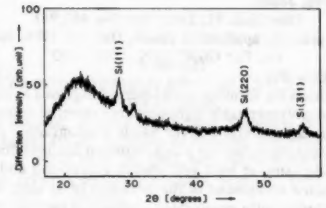
Takeshi Matsuo, Yokosuka, and Yukio Suzuki, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 26, 1982, Ser. No. 382,285

Claims priority, application Japan, May 29, 1981, 56-80743; May 29, 1981, 56-80745

Int. Cl.[4] G03G *5/08*

U.S. Cl. 430—84 21 Claims



1. An electrophotographic photosensitive member, which comprises an electroconductive supporting substrate and a photoconductive layer provided on said supporting substrate, wherein said photoconductive layer consists essentially of a crystalline silicon having a specific dark resistance greater than 10^6 ohm cm, said crystalline silicon being produced by a glow discharge method under the following conditions:

supporting substrate temperature: 300°–350° C.;

powder density: 0.5–5 W/cm^2; and

pressure: 0.01–10 Torr, using hydrogen as a carrier gas.

4,560,635

TONER COMPOSITIONS WITH AMMONIUM SULFATE CHARGE ENHANCING ADDITIVES

Thomas R. Hoffend, Webster, and Angelo J. Barbetta, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1984, Ser. No. 645,660

Int. Cl.[4] G03G *9/16*

U.S. Cl. 430—106.6 30 Claims

1. An improved positively charged toner composition comprised of resin particles, pigment particles, and a sulfate charge enhancing additive selected from the group consisting of distearyl dimethyl ammonium methyl sulfate, and behenyl trimethyl ammonium methyl sulfate.

4,560,636

LIGHT-SENSITIVE, POSITIVE-WORKING COPYING MATERIAL HAVING A ROUGH SURFACE PROVIDED BY PIGMENTS IN LIGHT-SENSITIVE LAYER

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 163,581, Jun. 27, 1980, abandoned. This application Apr. 13, 1984, Ser. No. 599,816

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2926236

Int. Cl.[4] G03C *1/60, 1/94;* G03F *7/08*

U.S. Cl. 430—165 4 Claims

1. A planographic printing form comprising a layer support and a positive-working light-sensitive layer having a thickness of between about 0.1 and 5 μm and comprising in admixture a light-sensitive constituent selected from the group consisting of a 1,2-naphthoquinone-diazide and a mixture containing (1) a compound which forms a strong acid upon exposure to light and (2) a compound which has at least one acid-cleavable C—O—C bond, which layer has a first surface facing said

layer support and a second surface, said second surface being rough and containing from about 0.02 to 2.0 percent by weight, relative to the total content of non-volatile constituents in the layer, of finely divided particles, wherein the average diameter of said particles is from about 1 to 15 μm larger than the thickness of said layer.

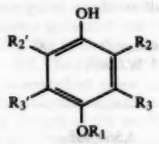
4,560,637

SILVER HALIDE SENSOR TYPE POLYMERIZABLE LIGHT-SENSITIVE MATERIAL

Minoru Maeda; Noriyuki Inoue, and Mikio Totsuka, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

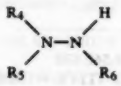
Filed Dec. 21, 1982, Ser. No. 451,911
Claims priority, application Japan, Dec. 22, 1981, 56-207731
Int. Cl.⁴ G03C *1/06, 5/54, 5/30*
U.S. Cl. 430—202 **27 Claims**

1. A process for forming a polymeric image in a silver halide sensor type polymerizable light-sensitive material comprising a support having thereon a silver halide photographic emulsion layer, comprising reducing a development nucleus-containing silver halide using at least one phenol compound and at least one hydrazine compound in the presence of at least one non-gaseous ethylenically unsaturated compound capable of undergoing addition polymerization to selectively polymerize the ethylenically unsaturated compound in an area where the development nucleus-containing silver halide is present, the phenol compound being represented by the following general formula (I):



(I)

wherein R_1 represents an alkyl group or a substituted alkyl group; R_2 and R_2', which may be the same or different, each represents hydrogen, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group or a halogen atom; and R_3 and R_3', which may be the same or different, each represents hydrogen, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, an alkoxy group, a thioalkyl group or a halogen atom, and the hydrazine compound being represented by the following general formula (II):



(II)

wherein R_4 represents hydrogen, a sulfo group (which may be a water-soluble metal salt or ammonium salt), an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an acyl group, a substituted acyl group, an arylhydrazinocarbonyl group, a thiocarbamoyl group, an arylazothiocarbonyl group, an arylsulfonyl group or a substituted arylsulfonyl group; R_5 represents hydrogen, an alkyl group, a substituted alkyl group or an aryl group; R_4 and R_5 may be bonded to each other to form a ring comprising a member selected from a carbon atom, an oxygen atom and a nitrogen atom; R_6 represents hydrogen, a sulfo group (which may be a water-soluble metal salt or ammonium salt), an aryl group, an acyl group or a substituted acyl group; and R_4 and R_6 may be bonded to each other to form a ring, or a salt thereof.

12. A process for forming a polymeric image as claimed in claim 1, wherein the phenol compound and the hydrazine compound, and the non-gaseous ethylenically unsaturated compound are incorporated in different layers of the photographic light-sensitive material.

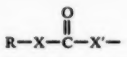
4,560,638

HALFTONE IMAGING SILVER HALIDE EMULSIONS, PHOTOGRAPHIC ELEMENTS, AND PROCESSES WHICH EMPLOY NOVEL ARYLHYDRAZIDES

James C. Loblaw, Webster, and Barbara B. Lussier, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,921
Int. Cl.⁴ G03C *1/06, 1/02*
U.S. Cl. 430—264 **14 Claims**

1. A high contrast negative working surface latent image forming silver halide emulsion comprised of an unballasted arylhydrazide, the aryl moiety of which is substituted with a group of the formula:



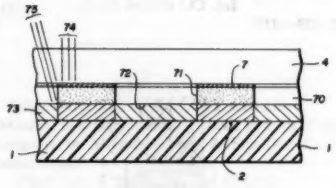
where one of X and X' represents —NH—, the other represents a divalent chalcogen, and R represents an aliphatic or aromatic residue.

4,560,639

REUSABLE PHOTOTRANSPARENCY IMAGE FORMING TOOLS FOR DIRECT CONTACT PRINTING

Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Continuation-in-part of Ser. No. 147,726, May 8, 1980. This application Aug. 31, 1983, Ser. No. 528,036
Int. Cl.⁴ G03C *5/16, 1/68;* **G03F** *9/00*
U.S. Cl. 430—273 **6 Claims**



1. A phototransparency image bearing phototool assembly comprising in combination,

a two-sided transparent supporting body sheet forming an outer sandwich layer with a surface on one side to be disposed innermost, a photo-imageable assembly adjacent the innermost said surface of said sheet comprising an inner uncured photopolymer layer,

a transparency image disposed on said innermost side adapted to expose in said polymer layer a corresponding image in response to radiation passed thereto by way of said transparent body,

and release surface structure on said transparency image surface for contacting said photopolymer layer of the photopolymer assembly without adhering to a photopolymer image cured in place in said polymer layer by said radiation with the transparency image extending through the release surface structure.

2. A phototool assembly as defined in claim 1 wherein the transparency image is disposed in a polypropylene film layer, and said release surface structure consists of the polypropylene film surface.

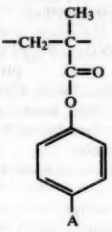
4,560,640

PHOTOSENSITIVE HIGH POLYMER, EASILY INSOLUBILIZED WHEN CROSS-LINKED BY LIGHT, A METHOD FOR PREPARATION THEREOF, AND A COMPOSITION THEREOF

Taichi Ichihashi, Osaka; Wasaburo Kawai, Kawanishi; Tadashi Naraoka, Takaishi, and Takateru Asano, Sakura, all of Japan, assignors to Director-General of Agency of Industrial Science & Technology, Sakai and Sanbo Chemical Industries Co., Ltd., Tokyo, both of, Japan

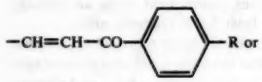
Filed Jun. 11, 1984, Ser. No. 619,461
Claims priority, application Japan, Jun. 13, 1983, 58-106402
Int. Cl.[4] G03C *1/68;* C08F *224/00, 218/02*
U.S. Cl. 430—280 10 Claims

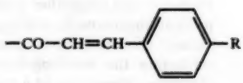
1. A photosensitive high polymer which is a random copolymer comprising a structural unit represented by the formula



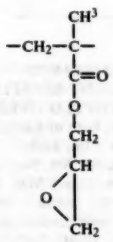
(I)

wherein A is





wherein R is hydrogen, methyl or methoxy and a structural unit represented by the formula



(II)

the polymer containing about 5 to about 80 mole % of structural units of the formula (I) and having a polymerization degree of about 300 to about 3000.

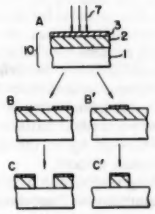
4. A process for preparing a photosensitive high polymer as defined in claim 1 which is characterized in that (a) at least one compound selected from the group consisting of 4-methacryloyloxybenzalacetophenone, 4'-methacryloyloxybenzalacetophenone, 4-methyl-4'-methacryloyloxybenzalacetophenone, 4-methoxy-4'-methacryloyloxybenzalacetophenone, 4'-methyl-4-methacryloyloxybenzalacetophenone and 4'-methoxy-4-methacryloyloxybenzalacetophenone, and (b) glycidyl methacrylate are subjected to copolymerization in solvent in the presence of polymerization initiator.

4,560,641

METHOD FOR FORMING FINE MULTILAYER RESIST PATTERNS

Yuuichi Kokaku; Makoto Kitoo, and Yoshinori Honda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,666
Claims priority, application Japan, Mar. 26, 1982, 57-47093; Sep. 22, 1982, 57-163849
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—312 16 Claims



13. A method for forming fine resist patterns comprising the sequential steps of:

(1) forming a lower layer on a substrate by plasma polymirizing at least one member selected from the group consisting of the following monomers (e) to (i):
- (e) plasma-polymerizable hydrocarbons;
- (f) plasma-polymerizable halogenated hydrocarbons;
- (g) styrene and styrene derivatives;
- (h) plasma-polymerizable oxygen-containing compounds; and
- (i) plasma-polymerizable nitrogen-containing compounds;

(2) forming an upper layer on the above lower layer by plasma-polymerizing the following mixture (k):
- (k) a mixture of at least one organosilicon compound with at least one monomer selected from the monomers (e) to (i),

said upper and lower layers forming a multilayer film, which multilayer film can be developed, to form a pattern, by plasma after patternwise exposure of the multilayer film to light or radiation;

(3) patternwise exposing the multilayer film to irradiation by a light or a radiation;

(4) exposing the upper layer, after said patternwise exposing, to plasma development in an atmosphere of a gas mixture of a fluorinated hydrocarbon and a gas selected from the group consisting of Ar, He, Ne, Xe, O_2 and N_2 in a partial pressure ratio of 1: (5 to 100); and then

(5) exposing the lower layer, after development of the upper layer, to plasma development in an atmosphere of O_2 or a gas mixture of O_2 and a gas selected from the group consisting of Ar, He, Ne, Xe, and N_2 in a partial pressure ratio of 1: (1 to 10).

4,560,642
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

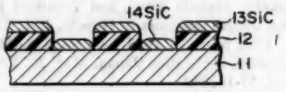
Toshio Yonezawa, Yokosuka; Takashi Ajima, Tokyo; Shunichi Hiraki, Yokohama; Yutaka Koshino, Tokyo, and Yoshitami Oka, Kawasaki, all of Japan, assignors to Toyko Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 403,550, Jul. 30, 1982, abandoned, which is a division of Ser. No. 262,938, May 12, 1981, Pat. No. 4,351,894, which is a continuation of Ser. No. 047,216, Jun. 11, 1979, abandoned, which is a continuation of Ser. No. 827,347, Aug. 24, 1977, abandoned. This application Jul. 19, 1984, Ser. No. 632,239

Claims priority, application Japan, Aug. 27, 1976, 51-102430; Oct. 26, 1976, 51-127808; Oct. 26, 1976, 51-127809

Int. Cl.[4] B05D *1/32*

U.S. Cl. 430—313 **3 Claims**



1. A method of preparing a silicon dioxide film perforated in a prescribed pattern, the film to be used as a mask on the surface of semiconductor material for manufacture of a dimensionally precise semiconductor device, the method comprising:

(a) forming a silicon dioxide film substantially covering the surface of the semiconductor material;

(b) adheringly covering said silicon dioxide film with a silicon carbide mask comprising a silicon carbide film perforated in the prescribed pattern wherein the silicon carbide mask is formed by a "lift off" process with the prescribed perforated pattern;

(c) selectively etching said silicon dioxide film using hydrofluoric acid or ammonium fluoride through the perforations having the prescribed pattern in said silicon carbide mask, thereby providing a dimensionally precise silicon dioxide mask for diffusion of an impurity or deposition of an electrode.

4,560,643
USE OF PHOTOSENSITIVE COMPOSITIONS OF MATTER FOR ELECTROLESS DEPOSITION OF METALS

Jürgen Finter, Freiburg, Fed. Rep. of Germany, and Walter Fischer, Reinach, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,777

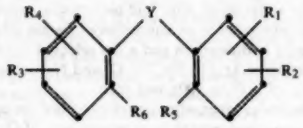
Claims priority, application Switzerland, Nov. 25, 1982, 6871/82

Int. Cl.[4] G03C *5/00, 5/24*

U.S. Cl. 430—346 **20 Claims**

1. A process for producing an image on the surface of an inorganic or organic substrate, which consists essentially of exposing a photosensitive composition of matter, coated on said substrate, which composition of matter contains

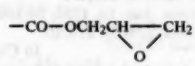
(a) 0.1 to 20 percent by weight of a compound of the formula I



(I)

in which R_1, R_2, R_3 and R_4 independently of one another are a hydrogen or halogen atom, C_{1-20}-alkyl, $—OR_7$, $—N(R_7)_2$, $—SR_7'$, $—NO_2$, $—SO_2R_7'$, $—COR_7$, $—COOR_7$, $—CON(R_7)_2$, C_{1-4}-halogenoalkyl, C_{1-4}-hydroxyalkyl, $—O—C_dH_{2d}—COOH$, $—O[CH_2CH(X—)O]_n—X$,

$—OCO—C(X)=CH_2$, $—CO—O[CH_2CH(X)O]_n—X$,



or $N(R_7)(CO—C(X)=CH_2)$ or R_1 and R_2 and/or R_3 and R_4 together are —CO—OCO— or —CO—$N(R_7)$—CO—, R_5 and R_6 are each hydrogen or together are a direct bond, $—CH_2—$, $—CH_2CH_2—$, —CH=CH—, —S—, —O—, —CO— or —NH—, R_7 is hydrogen, C_{1-20}-alkyl, C_{1-6}-hydroxyalkyl, allyl, propargyl, $—C_dH_{2d}—OCO—C(X)=CH_2$, phenyl, alkylphenyl having 1-4 C atoms in the alkyl moiety, benzyl, phenethyl, or cyclohexyl, R_7' has the same meaning as R_7, with the exception of hydrogen, n is a number from 1 to 50, d is a number from 1 to 4, X is hydrogen or methyl and Y is —CO— or —CO—CO—,

(b) 70 to 99.8 percent by weight of a polymer with H donor groups and an average molecular wieght of at least 2,000 Daltons, or of a polymer mixture which consists of at least one polymer component with H donor groups and an average molecular weight of at least 2,000 Daltons and at least one second polymer component with an average molecular weight of at least 3,000 Daltons, and

(c) 0.1 to 10 percent by weight of one or more salts of a metal of group Ib or VIII of the periodic table, the percentages by weight being based on the sum of a+b+c and components a, b and c together make up 100 percent by weight, to light imagewise in order to produce an image of zerovalent, non-conductive metal nuclei and then directly subjecting the resulting image containing substrate to electroless deposition of a metal.

12. A process according to claim 1, wherein the metal salt is a copper-II carboxylate, by itself or as a mixture with a copper-II halide.

4,560,644
HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIALS WITH SHIFTED DYES

Hideki Naito, and Kozo Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Japan

Filed Mar. 29, 1984, Ser. No. 594,491

Claims priority, application Japan, Mar. 29, 1983, 58-51656

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

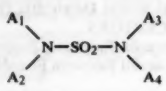
Int. Cl.[4] G03C *1/40*

U.S. Cl. 430—351 **16 Claims**

13. A method for forming an image, which comprises imagewise exposing and heating a heat-developable light-sensitive material comprising a support having thereon a light-sensitive silver halide, a binder and a dye releasing compound which is capable of reducing the light-sensitive silver halide and reacting with the light-sensitive silver halide by heating to release a dye;

wherein said dye releasing compound is changed so as to have shorter absorption wavelengths; and

wherein said light-sensitive material contains a compound represented by the general formula (A) in order to accelerate development and accelerate release of a dye,



(A)

wherein A_1, A_2, A_3, and A_4, which may be the same or different, each represents a hydrogen atom or a substituent selected from an alkyl group, a substituted alkyl group, a cycloalkyl group, an aralkyl group, an aryl group, a substituted aryl group and a heterocyclic group; and A_1 and A_2 or A_2 or A_3 and A_4 may combine with each other to form a ring.

4,560,645

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaharu Toriuchi, and Shigetoshi Ono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

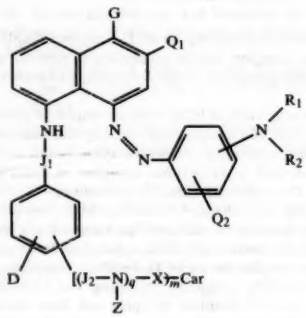
Filed Oct. 9, 1984, Ser. No. 658,925

Claims priority, application Japan, Oct. 6, 1983, 58-187406

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—562 **18 Claims**

1. A color photographic light-sensitive material which contains at least one light-sensitive negative working silver halide emulsion layer and associated with at least one of said emulsion layers at least one positive-working dye-providing compound represented by the following general formula (I):



(I)

wherein

Q_1 represents a hydrogen atom, a halogen atom, a sulfamoyl group of $—SO_2NR_3R_4$, an $—SO_2R_a$ group, a $—COOR_3$ group or a $—CONR_3R_4$ group, wherein R_3 and R_4 may be the same or different and each represents a hydrogen atom or R_a and wherein Ra represents an alkyl group, a substituted alkyl group, an aralkyl group, a substituted aralkyl group, an aryl group or a substituted aryl group, or wherein R_3 and R_4 are bonded together directly or through a nitrogen or oxygen atom to form a ring;

G represents a hydroxy group, a salt thereof, or —O—PR, wherein PR represents a protective group for —O— undergoing cleavage of O—PR bond under alkaline conditions;

R_1 and R_2 may be the same or different and each represents an alkyl group, a substituted alkyl group, an aryl group or a substituted aryl group, or R_1 and R_2 together represent atoms necessary for forming a 5- or 6-membered hetero ring;

Q_2 represents a sulfonic acid group, a salt thereof, or a sulfamoyl group represented by $—SO_2NR_5R_6$, wherein R_5 and R_6 are the same as defined for R_3 and R_4 in Q_1;

J_1 and J_2 each represents a sulfonyl group or a carbonyl group;

D represents a hydrogen atom, a halogen atom, a carboxyl group, a sulfo group, an alkyl group, a substituted alkyl group, an alkoxy group, a substituted alkoxy group, an aryl group, a substituted aryl group, or an amino group represented by $—NR_7R_8$, wherein R_7 and R_8 are the same as defined for R_3 and R_4 in Q_1;

Z represents a hydrogen atom, an alkyl group or a substituted alkyl group;

X represents a bivalent linking group of the formula $—A_1—L_n—(A_2)_p—$, wherein A_1 and A_2 may be the same or different and each represents an alkylene group, a substituted alkylene group, an aralkylene group, a substituted aralkylene group, a phenylene group or a substituted phenylene group, L represents a bivalent group selected from oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl and sulfonyl, and p and n each represents 0 or 1;

m and q each represents 0 or 1; and

Car represents a positive-working quinone moiety which undergoes cleavage in portions where no development of silver has taken place and does not undergo cleavage in portions where development of silver has taken place and, as a function of development, forms or releases a substance having an oxygen or sulfur atom as an end atom and having a mobility different from that of the dye providing compound.

4,560,646

PROTECTED DEVELOPING AGENTS

William E. Long, Wilmslow; Norman A. Smith, Holmes Chapel; Terence C. Webb, Wilmslow; Stephen R. Postle, Wilmslow; Kenneth M. McCombe, Altringham, and Martin C. Grossel, Surbiton, all of England, assignors to Ciba Geigy AG, Basle, Switzerland

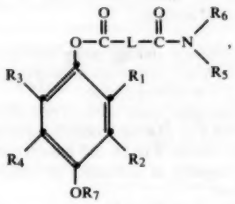
Filed Nov. 21, 1984, Ser. No. 673,625

Claims priority, application United Kingdom, Nov. 23, 1983, 8331264

Int. Cl.[4] G03C *1/02, 5/30*

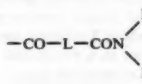
U.S. Cl. 430—566 **2 Claims**

1. Photographic silver halide material which comprises, on a support, at least one colloid silver halide layer, there being present either in the silver halide layer or in a layer in operative contact therewith, a compound of the formula



(1)

wherein the linking group L is a direct bond, alkylene or alkylene each having 1 to 4 carbon atoms or phenylene, all of which may be substituted, R_1, R_2, R_3 and R_4 are each hydrogen, unsubstituted or substituted alkyl or halogen, R_5 and R_6 are each hydrogen or methyl, ethyl, butyl p-tolyl, or combine to form a N-methylpiperazinyl or morpholinyl ring and R_7 is hydrogen or a group of formula



(2)

wherein L, R_5 and R_6 are as defined above.

4,560,647

ANTIBODY/ANTIGEN DETERMINATION METHOD

John Stocker, Flüh, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 346,664, Feb. 8, 1982, abandoned. This application Jan. 30, 1984, Ser. No. 575,237

Claims priority, application Switzerland, Feb. 19, 1981, 1104/81; Nov. 27, 1981, 7613/81

Int. Cl.[4] G01N *33/54*

U.S. Cl. 435—5 14 Claims

1. A method for determining in a fluid either (1) antigens associated with particles or (2) antibodies, said method consisting essentially of:

(a) adding to said fluid either antibodies specific to (1) or antigen, associated with particles, specific to (2), respectively,

(b) incubating the mixture resulting from (a) so as to permit the formation of an antigen/antibody complex,

(c) introducing the incubated mixture resulting from (b) into a container having a conical- or keel-shaped bottom recess, wherein at least the recess of the container is coated with an immunoglobulin-binding component directed against the antibodies in the antigen/antibody complex,

(d) freeing said antigen/antibody complex from unbound immunoglobulins before and/or after introducing the mixture resulting from (b) into said container,

(e) centrifuging said container,

(f) determining the amount of sediment in the container after step (e); and

(g) relating the amount of antigens or antibodies in the original fluid to the amount of sediment determined in step (f).

4,560,648

HOMOGENEOUS ENZYME IMMUNOASSAY FOR FERRITIN

Richard Armenta, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 23, 1983, Ser. No. 535,014

Int. Cl.[4] G01N *53/00, 33/549;* C12N *9/96*

U.S. Cl. 435—7 15 Claims

1. A compound of the formula:

$$F—(CO)_mRY]_n[S\text{-}Z]_n$$

wherein:

F is a protein of molecular weight of from about 250,000–1,000,000 daltons;

m is 0 or 1;

R is a saturated alicyclic linking group having a cycloalkyl portion of from 5 to 7 carbon atoms and an alkylene portion of from 0 to 4 carbon atoms;

Y is substituted ethylene joined to the S of S-Z at the α-position having from 4 to 10 atoms comprising carbon, chalcogen of atomic number 8 to 16 and nitrogen and having a β-substituent capable of activating an olefin group for β-thiol addition;

n is a number from 2 to about 10;

S-Z is an enzyme with an available thiol group.

10. A method for determining the presence of a high molecular weight protein in a medium suspected of containing the same, which comprises:

contacting -

(a) a medium suspected of containing a high molecular weight protein,

(b) a compound according to claim 1, and

(c) a receptor having sites common to and capable of binding to said high molecular weight protein and to said compound according to claim 1 wherein said receptor is at a concentration resulting in a substantial change in enzymatic activity of said compound, and

analyzing for the effect of said medium on the enzymatic activity of said compound.

4,560,649

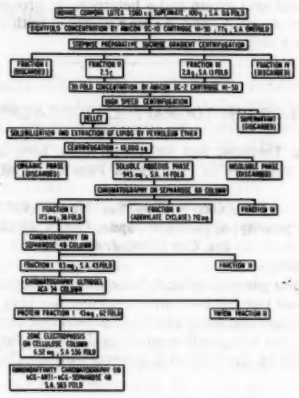
ASSAYING FOR HLH OR HCG WITH IMMOBILIZED HORMONE RECEPTORS

Brij B. Saxena, Englewood, and Premila Rathnam, Englewood Cliffs, both of N.J., assignors to Cornell Research Foundation, Ithaca, N.Y.

Continuation-in-part of Ser. No. 311,736, Oct. 15, 1981, abandoned. This application Nov. 9, 1982, Ser. No. 440,477

Int. Cl.[4] G01N *33/54, 33/74, 33/76*

U.S. Cl. 435—7 68 Claims



1. A process for preparing an hLH-enzyme complex or an hCG-enzyme complex which comprises a method selected from the group consisting of the following methods (A), (B) and (C):

(A) complexing hLH or hCG with a compound providing a reactive disulfide moiety, and reacting the complex with an enzyme containing an active thiol group to form a disulfide-linked hLH-enzyme complex or hCG-enzyme complex through thiol-disulfide exchange;

(B) separately complexing (1) hLH or hCG and (2) a non-thiolated enzyme to different portions of a compound providing a reactive disulfide moiety to form an hLH-disulfide complex or an hCG-disulfide complex, and an enzyme-disulfide complex, thiolating the hLH-disulfide complex or hCG-disulfide complex and then reacting the thiolated complex with said enzyme-disulfide complex; and

(C) separately complexing (1) hLH or hCG and (2) a non-thiolated enzyme to different portions of a compound providing a reactive disulfide moiety to form an hLH-disulfide complex or an hCG-disulfide complex, and an enzyme-disulfide complex, thiolating said enzyme-disulfide complex and then reacting the thiolated complex with said hLH-disulfide complex or said hCG-disulfide complex.

44. A process for qualitatively or quantitatively determining the hLH or hCG level in an unknown sample comprising:

(A) admixing an inert, solid support carrying hLH or hCG receptor with an unknown sample, and an hLH-enzyme complex or hCG-enzyme complex, or hLH-dye complex or hCG-dye complex;

(B) incubating the resulting admixture of step (A) under conditions to allow the hLH or hCG to react with said receptor;

(C) separating the resulting solid phase from the resulting liquid phase;

(D) when an enzyme complex is used, adding a material which forms a colored compound in the presence of the enzyme to either the liquid phase or the solid phase;

(E) qualitatively or quantitatively measuring the amount of colored material produced, wherein when a quantitative

measurement is made, comparing the amount of colored material produced with a standard curve to determine the quantitative result,

wherein the receptor is a product produced by the process comprising:

(1) homogenizing a receptor source material in an aqueous medium to disperse the receptor in a liquid aqueous fraction;

(2) separating and concentrating the liquid fraction;

(3) fractioning the concentrate to separate at least one of inactive protein and lipid from the receptor;

(4) re-dispersing the receptor in aqueous medium and extracting the aqueous medium with an organic solvent in which lipids are soluble to remove additional lipid from the aqueous phase;

(5) separating the aqueous phase from the remainder of the product of step (4);

(6) separating an hLH and hCG specific binding fraction of the receptor from adenyl cyclase and 5'-nucleotidase activity fractions of the receptor;

(7) subjecting the hLH and hCG specific binding fraction of the receptor to electrophoresis to separate said fraction from other remaining protein fractions; and

(8) recovering the resultant purified receptor.

4,560,650

METHOD AND COMPOSITIONS FOR DETERMINATION OF GAMMA GLUTAMYL TRANSPEPTIDASE

Henry W. Bauer, III, Miami, and Ravindra S. Shukla, Pembroke Pines, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 8, 1983, Ser. No. 502,282

Int. Cl.[4] C12Q *1/48, 1/36;* C12N *9/96*

U.S. Cl. 435—15 **21 Claims**

1. A diagnostic composition for determination of gamma glutamyl transpeptidase enzyme activity in biological fluids, comprising.

A. gamma glutamyl-p-nitroanilide; and

B. a water soluble, normally solid acid comprising sulfamic acid in an amount sufficient to provide sufficient acidity to solubilize said composition in water at room temperature for preparation of an aqueous substrate reagent.

4,560,651

DEBRANCHING ENZYME PRODUCT, PREPARATION AND USE THEREOF

Grethe C. Nielsen, Tastrup; Ivan V. Diers; Helle Outtrup, both of Vaerlose, and Barrie E. Norman, Farum, all of Denmark, assignors to Novo Industri A/S, Denmark

Continuation-in-part of Ser. No. 255,952, Apr. 20, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 434,745

Int. Cl.[4] C12P *19/22, 19/20, 19/16;* C12N *9/44, 1/20;* C12R *1/07*

U.S. Cl. 435—95 **12 Claims**

1. A debranching enzyme product comprising the debranching enzyme from a strain of Bacillus acidopullulyticus said enzyme being further characterized by:

(a) immunochemical properties identical or partially identical to those of the debranching enzyme derived from the Bacillus strain NCIB 11607 or NCIB 11639,

(b) activity optimum, measured by incubation for 30 minutes in acetate buffer of 0.05M at pH 4–5 at about 60° C.,

(c) pH optimum in the range of 3.5 to 5.5 as determined by incubation for 30 minutes in acetate buffer of 0.05M at about 60° C.,

(d) a residual activity after 72 hours at 60° C. as measured in a dextrose solution of 30 percent D.S. by weight at pH 5 of at least 50 percent.

4,560,652

PROCESS FOR PRODUCING L-TRYPTOPHAN BY FERMENTATION

Osamu Kurahashi, Kawasaki; Masahiro Kamada, Yokohama, and Hitoshi Enei, Zushi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,172

Claims priority, application Japan, Nov. 27, 1981, 56-190071

Int. Cl.[4] C12P *13/22;* C12N *15/00;* C12R *1/125*

U.S. Cl. 435—108 **8 Claims**

1. A process for producing L-tryptophan by fermentation, which comprises:

culturing aerobically in a culture medium containing a source of carbon, nitrogen and inorganic ions and minor nutrients an L-tryptophan-producing mutant of *Bacillus subtilis* which is resistant to azaserine and a tryptophan antagonist under conditions and for a time sufficient to produce L-tryptophan; and

recovering the L-tryptophan which accumulates in the culture medium.

4,560,653

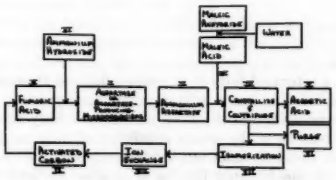
PROCESS FOR PREPARING L-ASPARTIC ACID

Martin B. Sherwin, Potomac, and John J. Blouin, Catonsville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,421

Int. Cl.[4] C12P *13/20*

U.S. Cl. 435—109 **7 Claims**



1. A process for preparing L-aspartic acid wherein a substrate comprising fumarate ion is contacted with aspartase or aspartase-producing microorganisms immobilized in an inert carrier to convert fumarate ion to L-aspartate, the improvement comprising: reducing the pH of the aqueous solution resulting from contact with said aspartase or aspartase-producing microorganisms to about 3 to 4 by addition of maleic anhydride, maleic acid or salts thereof to insolubilize L-aspartic acid while providing maleic acid in the supernatant phase, removing the insolubilized L-aspartic acid, isomerizing the maleic acid in the supernatant phase to fumaric acid, adjusting the pH of the supernatant phase to about 8 to 9, and passing the supernatant phase into contact with the aspartase or aspartase-producing microorganisms.

4,560,654

METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

Kiyoshi Miwa, Matsudo; Mahito Terabe, Yokohama; Masaaki Ishida; Hiroshi Matsui, both of Kawasaki, and Haruo Momose, Kamakura, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,557

Claims priority, application Japan, May 16, 1980, 55-65007

Int. Cl.[4] C12P *13/08;* C12N *15/00, 1/20*

U.S. Cl. 435—115 **6 Claims**

1. A method for producing L-lysine by fermentation, which comprises:

(a) culturing in a culture medium an L-lysine producing microorganism, wherein said microorganism is NRRL B-12418 or NRRL B-12421; and

(b) recovering the L-lysine which accumulates in the culture medium.

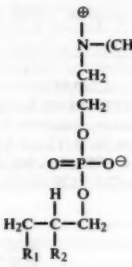
4,560,655

SERUM-FREE CELL CULTURE MEDIUM AND PROCESS FOR MAKING SAME

Paul E. Baker, Bozeman, Mont., assignor to Immunex Corporation, Seattle, Wash.

Filed Dec. 16, 1982, Ser. No. 450,430
Int. Cl.⁴ C12N *5/02, 5/00*
U.S. Cl. 435—241 **20 Claims**

1. A substitute for serum in cell culture media capable of long-term culture of suspension and monolayer cells and hybridoma cells and capable of supporting fusion of cells to form hybridomas, comprising fetuin, transferrin, albumin, cholesterol and phosphatidylcholine having the general formula:



wherein

R_1 is a saturated fatty acid residue derived from the group consisting of lauric acid, myristic acid, palmitic acid and stearic acid; and, R_2 is an unsaturated fatty acid residue derived from the group consisting of oleic acid, linoleic acid, linolenic acid, and arachidonic acid; or

R_1 is an unsaturated fatty acid residue derived from the group consisting of oleic acid, linoleic acid, linolenic acid, and arachidonic acid; and, R_2 is a saturated fatty acid residue derived from the group consisting of lauric acid, myristic acid, palmitic acid and stearic acid; and,

R_1 and R_2 are chemically bonded to the respective carbon atoms of the phosphatidylcholine.

4,560,656

PRODUCTION OF γ-DECALACTONE

Mohamad I. Farbood, Princeton, and Brian J. Willis, Ramsey, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

PCT No. PCT/US82/01323, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO83/01072, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 27, 1982, Ser. No. 448,891
Int. Cl.⁴ C12P *7/26, 7/02, 7/00, 7/64, 7/42;* C12N *9/14, 1/20;* C07B *19/02*
U.S. Cl. 435—146 **4 Claims**

1. A method of producing gama-decalactone comprising culturing fungi selected fro the group consisting of *Aspergillus oryzae, Geotrichum klebahnii* and *Yarrowia lipolytica* which hydrolyze and beta-oxidize castor oil in a medium comprising castor oil, said culturing taking place at a pH of about 3.5 to about 8.0, at a temperatur 15°–33° C. and for a period of time in the range from about 2 to about 240 hours so as to produce optically active gamma-hydroxydecanoic acid, thereupon in situ lactonizing the resulting produced gamma-hydroxydecanoic acid at a pH of from about 1 to about 5 and at a temperature in the range from about 50° C. for a sufficient period to convert the gamma-hydroxydecanoic acid to gamma-decalactone and recovering the resulting prodcued gamma-decalactone.

4,560,657

MICROBIOLOGICAL PRODUCTION OF ALKYLENE OXIDES

Jan W. Drozd, Sittingbourne, and Maureen L. Bailey, Ditton, Nr. Maidstone, both of United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 20, 1983, Ser. No. 515,711
Claims priority, application United Kingdom, Jul. 21, 1982, 8221113
Int. Cl.⁴ C12P *17/02;* C12N *1/20;* C12R *1/32*
U.S. Cl. 435—123 **10 Claims**

1. A process for the production of an alkylene oxide containing at least 3 carbon atoms which comprises cultivating an ethylene-utilizing microorganism Mycobacterium NCIB 11626 under aerobic conditions in the presence of ethylene and in a liquid nutrient medium containing the corresponding alkene together with assimilable sources of nitrogen and essential mineral salts.

10. A biologically pure culture of Mycobacterium NCIB 11626.

4,560,658

PRODUCTION OF BUTANOL BY FERMENTATION IN THE PRESENCE OF CARBON MONOXIDE

Rathin Datta, Chicago, Ill., and Joseph G. Zeikus, Okemos, Mich., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 5, 1983, Ser. No. 558,149
Int. Cl.⁴ C12P *7/16;* C12R *1/145*
U.S. Cl. 435—160 **12 Claims**

1. A process for the production of butanol comprising fermenting carbohydrates in an aqueous medium at suitable conditions of temperature and pH with *Clostridium acetobutylicum* in the presence of a gas containing carbon monoxide at a partial pressure of from about 0.05 atm to about 0.3 atm, and recovering said butanol.

4,560,659

ETHANOL PRODUCTION FROM FERMENTATION OF SUGAR CANE

Carlos E. R. Asturias, 23rd Avenida 4-67 Zone 15, Guatamala City, Guatemala

Continuation of Ser. No. 277,732, Jun. 26, 1981, abandoned, which is a continuation of Ser. No. 21,244, Mar. 15, 1979, abandoned. This application Sep. 1, 1983, Ser. No. 528,563
Int. Cl.⁴ C12P *7/14*
U.S. Cl. 435—162 **12 Claims**

1. A process for the production of ethanol consisting of:

combining comminuted dried sugar cane stalks having an average particle size diameter of from about 0.25 centimeter, to about 4.0 centimeter, Saccharomyces yeast and water to form an aqueous suspension of said comminuted stalks, simultaneously extracting and fermenting sucrose from said comminuted stalks in situ to ethanol, separating said comminuted stalks from which sucrose has been extracted from said suspension and introducing additional dried sugar cane stalks from which sucrose is simultaneously extracted and fermented.

4,560,660

FIXATION SUPPORT FOR MICROORGANISMS

Gilles Geirnaert, Saint-Palais-sur-Mer, France, assignor to Argiles & Mineraux AGS-BMP, Montguyon, France

Filed Apr. 15, 1983, Ser. No. 485,417
Claims priority, application France, Apr. 27, 1982, 82 07205; Sep. 21, 1982, 82 15845
Int. Cl.⁴ C12N *11/14;* C04B *35/04*
U.S. Cl. 435—176 **18 Claims**

1. A ceramic product in the form of a support for the fixation of microorganisms characterized in that it consists of a silicoaluminate having contents of 5 to 25% of magnesia and whose average granulometry is between 5 and 300 microns,

with such an interval that the diameter of the coarsest grains is at the maximum two times that of the smallest.

11. A ceramic support in accordance with claim **1** having fixed thereto a biological catalyst.

12. A ceramic product according to claim **1** wherein said support has fixed thereto an hybridoma.

4,560,661

PROCESS FOR PURIFYING ENZYMES

Hideo Katsumata, Gotenba; Shigeo Katsumata, Mishima; Shinzo Ishii, Shizuoka, and Yuko Arai, Susono, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,174

Claims priority, application Japan, Apr. 27, 1982, 57-70598

Int. Cl.[4] **C12N** *9/00, 9/02, 9/04, 9/14, 9/20, 9/88, 9/90, 9/92*

U.S. Cl. 435—183 **5 Claims**

1. A process for purifying an enzyme in a solution containing the enzyme which comprises bringing said solution into contact with a strongly acidic cation exchange resin of high porous type selected from the group consisting of Diaion HPA-25 and HPA-75, or a strongly basic anion exchange resin of high porous type wherein a quaternary ammonium group is introduced as exchange groups into a styrene-divinyl benzene polymer matrix of macro-reticular structure to adsorb the enzyme thereon, passing an eluting agent through said ion exchange resin to elute said enzyme therefrom and recovering active fractions of the eluate to obtain a purified enzyme solution.

4,560,662

STREPTOMYCES ANTIBIOTICUS ATCC 31771 AND PROCESS FOR OBTAINING SAME

Leonardo M. Cappelletti, Fayetteville, N.Y.; Roberto Spagnoli, and Luciano Toscano, both of Milan, Italy, assignors to Pierrel S.p.A., Naples, Italy

Division of Ser. No. 338,117, Jan. 8, 1982, Pat. No. 4,429,115. This application Nov. 3, 1983, Ser. No. 548,323

Claims priority, application Italy, Jan. 9, 1981, 19081 A/81

Int. Cl.[4] **C12R** *1/48;* **C12N** *1/20*

U.S. Cl. 435—253 **4 Claims**

1. A biologically pure culture of *S. antibioticus* ATCC 31771.

2. A process for the preparation of *S. antibioticus* ATCC 31771, comprising the steps of:

(a) subjecting spores of a stock of *S. antibioticus* producer of oleandomycin to a mutagenic radiation treatment with U.V. rays at a dosage such as to kill not less than 99 percent of the spores;

(b) culturing the residual spores and selecting colonies on the basis of their incapacity to produce oleandomycin and on the basis of the capacity of recognizing and converting substrates selected from the class consisting of erythronolide B, erythronolide A and erythronolide A oxime; and

(c) isolating said *S. antibioticus* ATCC 31771.

4,560,663

WELL LOGGING METHOD USING ELECTRON SPIN RESONANCE SIGNALS FROM HYDROCARBON CRUDE

Stephen W. Nicksic, Brea, and George W. Starke, Calistoga, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 202,045, Oct. 30, 1980, abandoned. This application Jun. 23, 1983, Ser. No. 507,428

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[4] **G01N** *24/08, 33/24*

U.S. Cl. 436—25 **13 Claims**

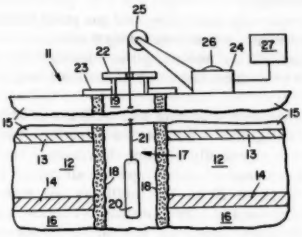
1. A logging method for identifying the presence of crude petroleum within a subsurface earth formation from within a well bore penetrating said earth formation comprising the steps of:

(a) measuring first electron spin resonance signals from asphaltene and resin constituents of crude petroleum within said earth formations along said well bore;

(b) recording said measured signals with respect to vertical depth within said earth formation along said well bore;

(c) treating said earth formation along said well bore with a material that effects the electron spin resonance signals from said asphaltene and resin constituents of crude petroleum;

(d) taking a second measurement of said electron spin resonance signals from said asphaltene and resin constituents of crude petroleum within said earth formation along said well bore;



(e) recording said second measurement of electron spin resonance signals with respect to the same dimensions of said first recorded signals; and

(f) identifying the presence of crude petroleum within said earth formation along said well bore by the indication of effect on said electron spin resonance signals attributable to said treatment of step (c).

4,560,664

PREDICTING HYDROCARBON POTENTIAL OF AN EARTH FORMATION UNDERLYING A BODY OF WATER BY ANALYSIS OF SEEPS CONTAINING LOW CONCENTRATIONS OF CARBONACEOUS GASES

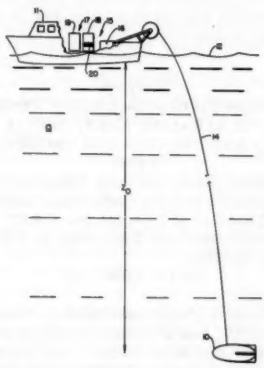
Gerard J. Demaison, Orinda, and Isaac R. Kaplan, Sherman Oaks, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 366,542, Apr. 8, 1982, Pat. No. 4,444,889. This application Dec. 30, 1983, Ser. No. 566,949

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.[4] **G01N** *33/24*

U.S. Cl. 436—29 **8 Claims**



1. Method of on-site collection and examination of small

concentrations of methane dissolved in water so as to predict hydrocarbon potential of an earth formation underlying a body of water, said formation being a source of said methane, comprising:

(i) at a known geographic location, continuously sampling said sea water at a selected flow rate and at a selected depth;

(ii) continuously vacuum separating said collected sea water into a liquid phase and a gas phase, and then analyzing said gas phase in an apparatus which performs the following further steps;

(iii) continuously monitoring said gas phase for the presence of hydrocarbon gases including methane;

(iv) quantitatively separating out all interfering gas species to the subsequent detection of methane and carbon dioxide;

(v) quantitatively oxidizing said methane to carbon dioxide without significant isotopic fractionation occurring;

(vi) then cryogenically trapping the resulting carbon dioxide in the presence of a non-trappable air carrier flowing at a rate of about 20 to 120 milliliters per minute without significant isotopic fractionation occurring; and

(vii) isotopically analyzing the carbon distribution of said carbon dioxide of step (vi) to thereby determine biogenic and/or thermogenic origin of said methane and to thereby aid in the evaluation of the hydrocarbon potential of said earth formation; the analysis of said gas phase being effected without significant isotopic fractionation of the methane products occurring.

4,560,665

METHOD OF MEASURING MEMBRANE FUSION

Taiji Nakae, Kanagawa, and Eisaku Ryo, Isehara, both of Japan, assignors to Fujirebio Kabushiki Kaisha, Kanagawa, Japan

Filed May 24, 1984, Ser. No. 613,893

Claims priority, application Japan, May 27, 1983, 58-92489

Int. Cl.[4] G01N *21/77, 33/52*

U.S. Cl. 436—172 **5 Claims**

1. A method of measuring extent of membrane fusions comprising:

(a) forming an aqueous mixture containing fused liposomes, wherein said fused liposomes are formed by fusing liposomes containing porins with liposomes lacking in porins and loaded with a first cation;

(b) admixing with the aqueous mixture, a fluorescent dye that is sensitive to negative potential, an ionophore specific for the first cation, and a second cation which does not combine with the ionophore and which is capable of instantaneously equilibrating with the first cation across liposome membranes containing porins; and

(c) measuring fluorescene quenching of the dye in the mixture formed in step (b) as an indication of the extent of membrane fusions.

4,560,666

HIGH STRENGTH GLASS-CERAMIC CONTAINING APATITE AND ALKALINE EARTH METAL SILICATE CRYSTALS AND PROCESS FOR PRODUCING THE SAME

Masahiro Yoshida, Tokyo, and Kenji Nakagawa, Saitama, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,977

Claims priority, application Japan, Dec. 20, 1983, 58-238820; Dec. 22, 1983, 58-240968

Int. Cl.[4] C03C *3/22*

U.S. Cl. 501—5 **4 Claims**

1. A high strength glass-ceramic having a bending strength from at least 1500 kg/cm^2 and containing apatite crystals and at least one alkaline earth metal silicate crystal selected from the group consisting of diopside, forsterite and akermanite and having a composition consisting essentially of, in % by weight,

8 to 34% MgO;
12 to 43% CaO;
25 to 40% SiO_2;
10 to 25% P_2O_5;
with proviso of 90% or more $MgO+CaO+SiO+P_2O_5$,
0 to 10% Li_2O;
0 to 5% Na_2O;
0 to 10% K_2O;
0 to 10% SrO;
0 to 10% B_2O_3;
0 to 10% TiO_2;
0 to 10% Nb_2O_5;
0 to 10% Ta_2O_5; and
0 to 3% F_2,
with proviso of 10% or less $Li_2O+Na_2O+K_2O+SrO+B_2O_3+TiO_2+Nb_2O_5+Ta_2O_5+F_2$.

3. A high strength glass-ceramic having a bending strength from at least 1500 kg/cm^2 and containing apatite crystals and at least one alkaline earth metal silicate crystal selected from the group consisting of diopside, forsterite and akermanite and having a composition consisting essentially of, in % by weight,

8 to 34% MgO;
12 to 43% CaO;
25 to 40% SiO_2;
10 to 25% P_2O_5;
1 to 10% Al_2O_3, ZrO_2 or both
with proviso of 90% or more $MgO+CaO+SiO+P_2O_5+(Al_2O_3+ZrO_2)$,
0 to 10% Li_2O;
0 to 5% Na_2O;
0 to 10% K_2O;
0 to 10% SrO;
0 to 10% B_2O_3;
0 to 10% TiO_2;
0 to 10% Nb_2O_5;
0 to 10% Ta_2O_5; and
0 to 3% F_2,
with proviso of 10% or less $Li_2O+Na_2O+K_2O+SrO+B_2O_3+TiO_2+Nb_2O_5+Ta_2O_5+F_2$.

4,560,667

HALOGEN GLASSES MODIFIED WITH CARBON DISULPHIDE AND PROCESS OF PREPARATION

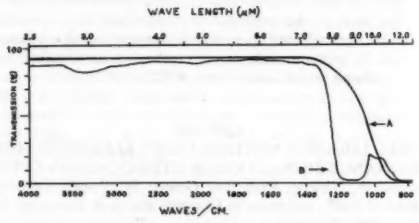
Jacques Lucas, Betton, and Gilles Fonteneau, Chateaugiron, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Jul. 20, 1984, Ser. No. 632,902

Claims priority, application France, Jul. 25, 1983, 83 12258

Int. Cl.[4] C03C *3/12, 21/00*

U.S. Cl. 501—40 **12 Claims**



1. Improved halogen glass essentially free of parasitic absorption bands in the infra-red range comprising CS_2 modified halogen glass containing at least one halide of a metal of an atomic weight greater than 23, the glass having been heated to a temperature above its fusion temperature and subjected to the action of carbon disulfide gas in a controlled atmosphere to reduce the hydroxyl ion content and the metal-oxygen bonds sufficiently to essentially eliminate parasitic absorption bands in the infra-red range.

4. A method of preparing an improved halogen glass essen-

tially free of parasitic absorption bands in the infra-red region comprising, subjecting a halogen glass, heated to a temperature above its fusion temperature, to the action of carbon disulphide gas, in a controlled atmosphere.

4,560,668

SUBSTANTIALLY PORE-FREE SHAPED ARTICLES OF POLYCRYSTALLINE SILICON CARBIDE, AND A PROCESS FOR THEIR MANUFACTURE BY ISOSTATIC HOT-PRESSING

Klaus Hunold, Kempten; Alfred Lipp, Bad Worishofen, and Klaus Reinmuth, Durach, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 424,099, Sep. 27, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,608

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142058

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—92 **13 Claims**

1. A substantially pore-free shaped article consisting essentially of polycrystalline silicon nitride and polycrystalline silicon carbide in the form of a homogenous microstructure having a total content of metallic impurities of not more than 0.2% by weight and having a grain size of not more than 10 μm which are manufactured without a sintering aid from mixtures of Si_3N_4 powder and SiC powder in a weight ratio of from 5:95 to 95:5 having a total content of metallic impurities of not more than 0.2% by weight, based on the total weight of the pulverulent mixture, by isostatic hot pressing in a vacuum-sealed casing at a temperature of from 1800° to 2200° C. and a pressure of from 100 to 400 MPa in an inert gas as pressure-transfer medium.

4,560,669

SILICON NITRIDE SINTERED BODIES OF SI_3N_4, Y_2O_3, MGO AND ZRO_2

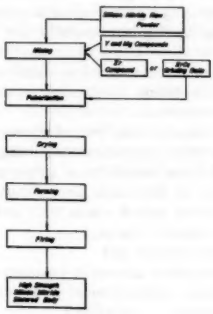
Keiji Matsuhiro, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 11, 1983, Ser. No. 540,309

Claims priority, application Japan, Sep. 2, 1983, 58-160551

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—97 **13 Claims**



1. Silicon nitride sintered bodies consisting of Si_3N_4, O, Y, Mg and Zr, wherein a content of Si_3N_4 is 95–70% by weight, a content of yttrium is 15–2% by weight calculated as Y_2O_3, a content of magnesium is 15–0.5% by weight calculated as MgO and a content of zirconium is 13–0.5% by weight calculated as ZrO_2, said silicon nitride sintered bodies being manufactured by a method consisting essentially of forming a mixed raw material consisting of 95–70% by weight of silicon nitride raw material, yttrium compound of 15–2% by weight calculated as Y_2O_3, magnesium compound of 15–0.5% by weight calculated as MgO and zirconium compound of 13–0.5% by weight calculated as ZrO_2, into a shaped body, said yttrium compound, magnesium compound and zirconium compound being sintering aids and firing the shaped body at a temperature of 1,650°–1,800° C., under ambient pressure in a nitrogen or an inert gas atmosphere, wherein said sintered bodies have a relative theoretical density of greater than 95%, a four-point flexural strength at 1,200° C. in air of greater than 60 kg/mm^2 and a weight increase due to oxidation after exposing in air at 1,200° C. for 100 hours of less than 0.5 mg/cm^2.

2. Silicon nitride sintered bodies as claimed in claim 1, wherein a content ratio of Y and Mg is 9-1 calculated as weight ratio of Y_2O_3/MgO.

3. The silicon nitride sintered bodies as claimed in claim 1, wherein the zirconium compound is added through abrasion of grinding balls which are used to pulverize the mixed raw powder, and said grinding balls consist of greater than 70% by weight of zirconia and the remainder consists of materials selected from the group consisting of Y_2O_3, MgO and mixtures thereof.

4,560,670

METHOD FOR REGENERATION OF CATALYSTS BY REMOVAL OF NITROGEN POISONS

Bruce P. Pelrine, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1983, Ser. No. 559,668

Int. Cl.[4] B01J *29/38;* **C10G** *47/16, 45/64*

U.S. Cl. 502—26 **7 Claims**

1. A method for enhancing the regeneration of a substantially spent or end-of-cycle catalyst containing poisonous nitrogen compounds comprising the improvement wherein the catalyst off-stream and prior to being subjected to a hydrogen regeneration process is contacted under suitable conditions of time, temperature and pressure with a mixture consisting essentially of a C_1–C_{36} alkylamine or mixtures thereof and a suitable solvent, maintaining said amine and said solvent at such temperatures that their critical temperatures are not exceeded and they are maintained in the liquid state, thereby exchanging the less basic poisonous nitrogen compounds contained in said catalyst for said alkylamine and thereafter carrying out said hydrogen regeneration process.

4,560,671

OLEFIN POLYMERIZATION CATALYSTS ADAPTED FOR GAS PHASE PROCESSES

Laurence H. Gross, Bridgewater, and Allen Noshay, East Brunswick, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 510,216, Jul. 1, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 724,051

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—105 **13 Claims**

10. A process for preparing an olefin polymerization catalyst composition for use in a fluidized bed polymerization process which comprises mixing, in a high speed bladed finishing device

(a) about 50 to 95 weight % of solid inert particulate organic support material having an average particle size of 0.05 to 0.35 mm, a melting point of about 70° to 170° C., and a density of about 0.9 to 1.5 grams/cc, and

(b) about 5 to 50 weight % of solid particulate transition metal based low pressure olefin polymerization catalyst precursor which is a precursor of a high activity Ziegler or Ziegler-Natta type catalyst, said mixing being conducted under such friction induced heat conditions, and for a period of time, as are sufficient to cause the (a) parti-

cles of support material to soften, but not to fuse with each other, and the (b) particles of catalyst precursor to become embedded in and/or adhered to said (a) particles, without causing any deterioration in the chemical nature of either the (a) or (b) particles.

4,560,672

RUTHENIUM-COPPER-CONTAINING, ACTIVATED-CARBON-SUPPORTED CATALYST AND PROCESS FOR MAKING ALCOHOL USING SAME

Thomas G. Attig, Aurora; Anne M. Graham, Northfield Center, and Frederick Pesa, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 4, 1984, Ser. No. 616,968
Int. Cl.⁴ B01J *23/02, 23/40, 27/24, 23/06*
U.S. Cl. 502—183 **10 Claims**

1. A catalyst comprising a ruthenium-copper-containing complex of the formula

$$M_aA_bRuCu_cN_zO_x$$

wherein

M is selected from the group consisting of Ce, Cr, Fe, Mn, and mixtures thereof,

A is an alkali metal, alkaline earth metal or mixture thereof,

a is from 0 to about 1,

b is from about 0.002 to about 10,

c is from about 0.2 to about 20,

z is from 0 to about 1% by weight,

x is the number of oxygens needed to fulfill the valence requirements of the other elements, said complex being supported by

an activated carbon support having a surface area of at least about 300 square meters per gram.

4,560,673

CATALYST FOR THE OXIDATION OF UNSATURATED ALDEHYDES

Wilfrid G. Shaw, Lyndhurst, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 560,289, Dec. 12, 1983. This application Mar. 20, 1985, Ser. No. 713,953
Int. Cl.⁴ B01J *21/06, 23/22, 23/28, 23/72*
U.S. Cl. 502—206 **4 Claims**

1. A complex oxide catalyst consisting essentially of the elements and the ratios thereof represented by the empirical formula:

$$Mo_aV_bZr_cX_dY_eO_f$$

wherein

X is one or more of Cu and Mg;

Y is one or more of K, Rb, Cs, Sn, Ti, Cr, Re, Sb, Mn, Ge, Ca, Ba, Zn, Ag, Cd, La, As, Bi, B and W, and

a is 9–15;

b is 0.5–5;

c is 0.1–3;

d is 0.01–2;

e is 0–1;

f is a number sufficient to satisfy the valency requirements of the other elements present, and

wherein the catalyst is essentially free of P, Ce, Al, Fe and Ni.

4,560,674

CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

James T. Wrobleski, St. Louis; James W. Edwards, Creve Coeur; Charles R. Graham, St. Charles; Robert A. Keppel, and Harold Raffelson, both of St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,360
Int. Cl.⁴ B01J *27/14*
U.S. Cl. 502—209 **6 Claims**

1. A catalyst composition for the production of maleic anhydride by the partial oxidation of nonaromatic hydrocarbons which comprises the mixed oxides of phosphorus and vanadium, which catalyst

(a) is characterized by

(i) an average valence state of vanadium from about +3.9 to about +4.6,

(ii) a phosphorus/vanadium atom ratio of about 0.5 to about 2.0, and

(iii) a macrostructure predominantly comprising generally spheroidal particles consisting of radially oriented three-dimensional networks of randomly shaped open cells, and

(b) exhibits a weight/weight productivity to maleic anhydride of at least 70 g MAN/kg cat.-hr based upon a performance test conducted at a concentration of 1.5 mole percent hydrocarbon-in-air, a space velocity of 1450 hr^{-1} under a pressure of 1.055×10^2 kPa-G, and a temperature sufficient to maintain the hydrocarbon conversion within the range of 70 mole percent to 90 mole percent.

4,560,675

ADSORBENT FOR SEPARATING FATTY ACIDS FROM ROSIN ACIDS

Michael T. Cleary, Elmhurst, Ill., and William C. Laughlin, Edmond, Okla., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 408,100, Aug. 13, 1982, Pat. No. 4,495,106. This application Dec. 26, 1984, Ser. No. 686,498
Int. Cl.⁴ B01J *20/10*
U.S. Cl. 502—407 **15 Claims**

1. A selectively adsorbent molecular sieve for separating tall oil components comprising silicalite in an inert silica matrix, said matrix comprising a gelled colloidal amorphous silica, said molecular sieve having substantially no hydroxyl groups thereon.

3. A method of manufacturing a selectively absorbent molecular sieve comprising silicalite in an inert silica matrix, which method comprises:

(a) mixing silicalite powder into an aqueous colloidal dispersion of amorphous particles comprising discrete uniform spheres of silica which have substantially no internal surface area or detectable crystallinity dispersed in an alkaline medium which reacts with said silica surface to produce a negative charge;

(b) gelling said mixture; and

(c) treating said gelled mixture in a manner effecting substantially complete elimination of hydroxyl groups on said molecular sieve.

4,560,676

N^{α}-DESACETYLTHYMOSINα_1 AND PROCESS

Robert B. Merrifield, Cresskill, N.J., assignor to The Rockefeller University, New York, N.Y.

Division of Ser. No. 137,939, Apr. 7, 1980, Pat. No. 4,293,455. This application Apr. 13, 1981, Ser. No. 253,968
Int. Cl.⁴ A61K *37/00*
U.S. Cl. 514—12 **2 Claims**

1. Desacetylthymosin α_1 as a homogeneous peptide.

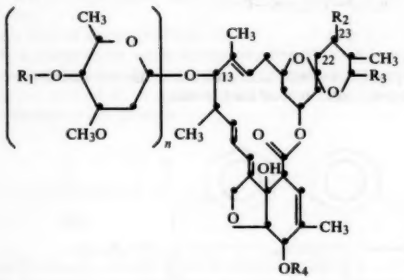
4,560,677

SYNERGISTIC AVERMECTIN COMBINATION FOR TREATING PLANT PESTS

Richard A. Dybas, Bridgewater, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 31, 1984, Ser. No. 575,614
Int. Cl.[4] A61K *31/70, 31/365*
U.S. Cl. 514—30 7 Claims

5. A method for the treatment of the motile stages of arthropod pests of plants which comprises treating such plants with an aqueous synergistic combination of a compound having the formula:

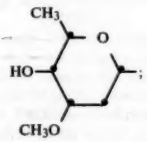


wherein

the broken line indicates either a single or a double bond at the 22,23-position;

n is 0 or 1 such that when n is 0 a hydroxy is present at the 13-position;

R_1 is hydrogen or



R_2 is hydrogen or hydroxy provided that R_2 is present only when the broken line indicates a single bond;

R_3 is sec-butyl or isopropyl; and

R_4 is hydrogen or methyl, and an agricultural spray oil consisting of a non-phytotoxic, highly refined hydrocarbon oil of at least 92% unsulfonated residues such that the active ingredient is present at from 0.03 to 8 ppm, and the agricultural spray oil is present at from 0.06 to 0.5%.

4,560,678

NOVEL THERAPEUTIC COMPOSITION USEFUL PARTICULARLY FOR HEALING WOUNDS

Michèle Ranson, 7, place du Général, 75017 Paris, Frances

Filed Nov. 7, 1983, Ser. No. 549,558
Claims priority, application France, Nov. 18, 1982, 82 19294
Int. Cl.[4] A61K *31/70, 31/415, 31/07*
U.S. Cl. 514—44 12 Claims

1. A therapeutic composition useful for the treatment of wounds, constituted by an association of an amount effective to improve healing of wounds of each of allantoin and highly polymerized desoxyribonuncleic acid (DNA) and optionally a pharmaceutically acceptable carrier.

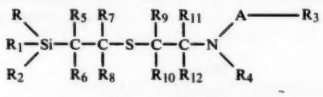
4,560,679

ORGANOSILICON COMPOUNDS AND ANTITUMOR AGENTS CONTAINING THE COMPOUND AS EFFECTIVE COMPONENT

Shigeshi Toyoshima, Tokyo; Masayasu Kurono; Ryoichi Unno, both of Nagoya, and Koichi Ito, Higashi-kurume, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co. Ltd., Aichi and Shin-Etsu Chemical Co. Ltd., Tokyo, both of, Japan

Filed Oct. 17, 1983, Ser. No. 542,439
Claims priority, application Japan, Oct. 16, 1982, 57-181782
Int. Cl.[4] A61K *31/695;* C07F *7/10*
U.S. Cl. 514—63 22 Claims

1. A novel organosilicon compound represented by a formula



wherein A is methylene, carbonyl or sulfonyl, R, R_1 and R_2 are alkyl of 1 to 7 carbon atoms, respectively, R_3 is hydrogen, alkyl of 1 to 7 carbon atoms, alkyl of 1 to 7 carbon atoms substituted with halogen, alkenyl of 2 to 7 carbon atoms, phenyl, phenyl substituted with chloro, bromo, methyl or methoxy, naphthyl, naphthyl substituted with —OH or methoxy, pyridyl, cyclohexyl methyl substituted pyridyl, furyl, methyl substituted furyl, thienyl, methyl substituted thienyl or cycloalkyl when taken together with substituent A; R_4 is hydrogen, alkyl of 1 to 7 carbon atoms or alkenyl of 2 to 7 carbon atoms; and R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11} and R_{12} are hydrogen, or a non-toxic, salt thereof with the provision that R_4 is not alkyl when A is methylene and R_3 is hydrogen.

9. An antitumor composition comprising an antitiumor effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

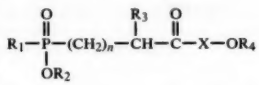
4,560,680

AMINOALKYL AND RELATED SUBSTITUTED PHOSPHINIC ACID ANGIOTENSIN CONVERTING ENZYME INHIBITORS

Denis E. Ryono, Princeton, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

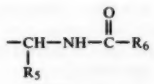
Division of Ser. No. 357,941, Mar. 15, 1982, Pat. No. 4,452,791.
This application May 10, 1984, Ser. No. 608,850
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/675;* C07F *9/60, 9/65*
U.S. Cl. 514—82 12 Claims

1. A compound of the formula



I

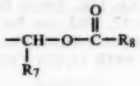
and pharmaceutically acceptable salts thereof, wherein R_1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, aminoalkyl, furyl, furylalkyl, thienyl, thienylalkyl, pyridyl, pyridylalkyl or



and R_5 and R_6 are independently selected from hydrogen, lower alkyl, haloalkyl, aryl, alkylaryl, cycloalkyl, cycloalkylal-

kyl, furyl, furylalkyl, thienyl, thienylalkyl, pyridyl or pyridylalkyl;

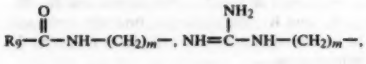
R_2 and R_4 each is independently hydrogen, lower alkyl, arylalkyl, benzhydryl or

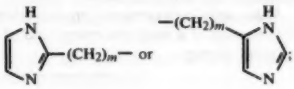


wherein R_7 is hydrogen, lower alkyl or phenyl, R_8 is hydrogen, lower alkyl, lower alkoxy or phenyl or R_7 and R_8 taken together are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$, or

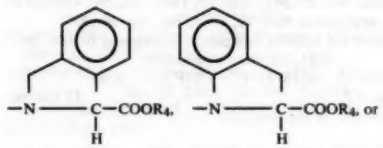
n is 0 or 1;

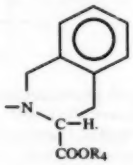
R_3 is $NH_2(CH_2)_m-$,





R_9 is hydrogen, lower alkyl, aryl or arylalkyl, and m is 0 or an integer of from 1 to 5, and $-XOR_4$ is an imino or amino acid derivative of the formula





10. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of a hypotensive agent as defined in claim 1 or pharmaceutically acceptable salt thereof.

12. The method of alleviating hypertension in a mammalian specie which comprises administering an effective amount of the composition of claim 10.

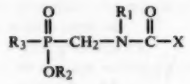
4,560,681

PHOSPHINYLMETHYLAMINOCARBONYL IMINO ACID COMPOUNDS USEFUL FOR TREATING HYPERTENSION

Donald S. Karanewsky, Princeton Junction, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

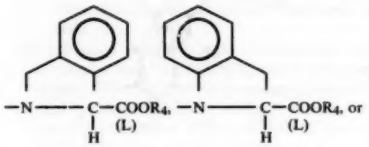
Division of Ser. No. 371,033, Apr. 22, 1982, Pat. No. 4,448,772.
This application Mar. 9, 1984, Ser. No. 588,162
Int. Cl.[4] A61K *31/675*; C07F *9/60, 9/65*
U.S. Cl. 514—82 9 Claims

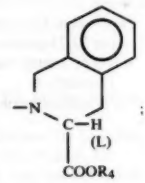
1. A compound of the formula



and pharmaceutically acceptable salts thereof wherein:

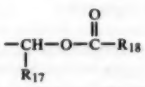
X is an imino acid of the formula





R_1 is hydrogen, lower alkyl, halo substituted lower alkyl, amino substituted lower alkyl, benzyl, or phenethyl;

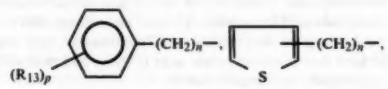
R_2 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and



wherein R_{17} is hydrogen, alkyl, cycloalkyl, or phenyl, and R_{18} is hydrogen, alkyl, cycloalkyl, phenyl, benzyl, phenethyl, or R_{17} and R_{18} taken together are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$, or

and

R_3 is alkyl, halo substituted lower alkyl, amino substituted lower alkyl, cycloalkyl—$(CH_2)_n-$,



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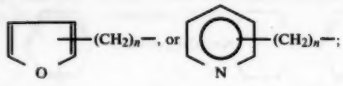
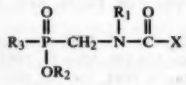


R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or benzyl;

p is one, two or three provided that p is more than one only if R_{13} is hydrogen, methyl, methoxy, chloro, or fluoro; and

n is zero or an integer from 1 to 7.

8. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and a hypotensively effective amount of an agent or pharmaceutically acceptable salt thereof of the formula



wherein R_1, R_2, R_3 and X are as defined in claim **1**.

9. The method of alleviating hypertension in a mammalian species which comprise administering an effective amount of the composition of claim **8**.

4,560,682

ORGANOPHOSPHORIC ACID ESTERS OF BENZOFURANOLS AND PESTICIDAL COMPOSITIONS THEREOF

Ohta Hiroki, Kokubunji; Oda Masatsugu, Machida, and Kato Jun, Gotenba, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

PCT No. PCT/JP84/00167, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/03886, PCT Pub. Date Oct. 11, 1984

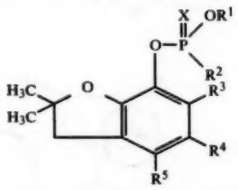
PCT Filed Apr. 4, 1984, Ser. No. 682,006

Claims priority, application Japan, Apr. 7, 1983, 58-61331; Aug. 30, 1983, 58-158297

Int. Cl.[4] **A01N** *57/16, 57/24;* **C07F** *9/14, 9/18*

U.S. Cl. 514—100 **8 Claims**

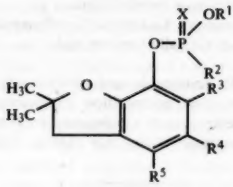
1. An organophosphoric acid ester represented by the general formula:



(I)

where R^1 is an alkyl group, R^2 is an alkyl group or a thioalkyl group, each of R^3, R^4 and R^5 is a hydrogen atom, a halogen atom, an alkylthio group, a nitro group, a cyano group, an alkyl group, an alkylsulfinyl group, an alkylsulfonyl group or a trifluoromethyl group, and X is an oxygen atom or a sulfur atom.

7. A pesticidal composition comprising an active ingredient selected from the organophosphoric acid esters represented by the general formula:



(I)

where R^1 is an alkyl group, R^2 is an alkyl group or a thioalkyl group, each of R^3, R^4 and R^5 is a hydrogen atom, a halogen atom, an alkylthio group, a nitro group, a cyano group, an alkyl group, an alkylsulfinyl group, an alkylsulfonyl group or a trifluoromethyl group, and X is an oxygen atom or a sulfur atom, and an adjuvant.

4,560,683

CEPHALOSPORIN ANTIBIOTICS

Brian E. Looker, Greenford, England, assignor to Glaxo Group Limited, London, England

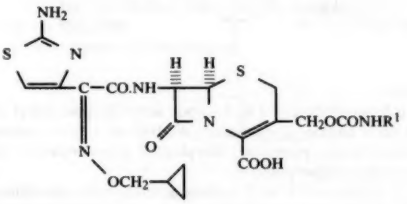
Filed Jun. 29, 1983, Ser. No. 509,043

Claims priority, application United Kingdom, Jun. 30, 1982, 8218874; Aug. 2, 1982, 8222236

Int. Cl.[4] **A61K** *31/545;* **C07D** *501/24*

U.S. Cl. 514—202 **5 Claims**

1. Cephalosporin antibiotics having a formula



(I)

wherein R^1 represents a hydrogen atom or a methyl or 2-chloroethyl group and non-toxic salts and nontoxic metabolically labile esters thereof.

4,560,684

1,4-BENZODIAZEPINE DERIVATIVES

Tsutomu Sugasawa, Hyogo; Makoto Adachi; Kazuyuki Sasakura, both of Nara; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

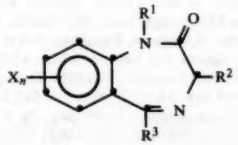
Filed Dec. 13, 1983, Ser. No. 560,994

Claims priority, application Japan, Dec. 21, 1982, 57-225273

Int. Cl.[4] **A61K** *31/55;* **C07D** *401/04, 403/04*

U.S. Cl. 514—221 **15 Claims**

1. A compound of the formula:



in which

R^1 is pyrrolidinyl or piperidinyl each optionally substituted by phenyl-C_{1-3} alkyl, C_{1-5} alkanoyl, or C_{2-5} alkoxycarbonyl,

R^2 is hydrogen, hydroxy, or acetoxy,

R^3 is C_{1-3} alkyl, phenyl-C_{1-3} alkyl, or phenyl optionally substituted by one or two halogens,

X is hydrogen, halogen, C_{1-3} alkyl, C_{1-3} alkoxy, nitro, trifluoromethyl, or di-C_{1-3} alkyl-amino, and

n is 1 or 2

or pharmaceutically acceptable acid addition salts thereof.

14. A pharmaceutical composition comprising a psychotropically effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier, diluent, and/or excipient.

4,560,685

2-PIPERAZINO-PTERIDINES USEFUL AS ANTITHROMBOTICS AND ANTIMETASTATICS

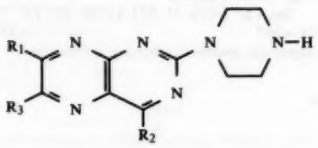
Josef Roch; Josef Nickl; Erich Müller; Berthold Narr; Johannes Weisenberger, all of Biberach; Rainer Zimmermann, Mittelbiberach, and Walter Haarmann, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,438

Int. Cl.[4] A61K *31/505;* **C07D** *475/08*

U.S. Cl. 514—222 **9 Claims**

1. A compound of the formula



wherein

R_1 is [phenyl(alkyl of 1 to 3 carbon atoms)]amino, (alkyl of 1 to 3 carbon atoms)amino, di(alkyl of 1 to 3 carbon atoms)amino, piperidino, morpholino, thiomorpholino or 1-oxido-thiomorpholino;

R_2 is di(alkyl of 1 to 3 carbon atoms)amino, piperidino, morpholino, thiomorpholino or 1-oxido-thiomorpholino; and

R_3 is halogen, alkoxy of 1 to 3 carbon atoms, (alkyl of 1 to 3 carbon atoms)thio, phenyl(alkoxy of 1 to 3 carbon atoms) or phenyl(alkyl of 1 to 3 carbon atoms)thio;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. The method of preventing or relieving thromboses or inhibiting metastases in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antithrombotic or antimetastatic amount of a compound of claim **1**.

4,560,686

METHOD FOR TREATING CIRCULATORY DISEASES BY USING (2-LOWER ALKOXYPHENYL)PIPERAZINE DERIVATIVES

Hiroyuki Nagano; Mitiro Takagi; Noboru Kubodera, all of Saitama; Isao Matsunaga; Hiroyuki Nabata, both of Tokyo; Yasuhiro Ohba, Kanagawa; Kazushige Sakai, Tokyo; Shunichi Hata, Kanagawa, and Yasumi Uchida, Chiba, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

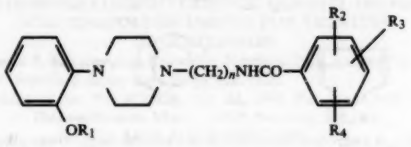
Filed Sep. 14, 1983, Ser. No. 532,271

Claims priority, application Japan, Sep. 24, 1982, 57-165049

Int. Cl.[4] A61K *31/495;* **C07D** *241/04*

U.S. Cl. 514—255 **3 Claims**

1. A method for treating arrhythmia or a disease treatable by an agent for vasodilating blood vessels which comprises administering to a patient in need of said treatment an effective amount for said treatment of a phenylpiperazine compound of the formula



(wherein R_1 is C_1–C_3 alkyl group; R_2, R_3 and R_4, which may be the same or different, represent a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group, a hydroxy group, a trifluoromethyl group or an alkoxycarbonyl group having a C_1–C_3 alkoxy group; n is an integer of 2 to 6) or a salt thereof.

4,560,687

SUBSTITUTED AROMATIC COMPOUNDS

Martin G. Baxter, 34 Whitehead Close, Wilmington, Dartford, Kent; Albert R. Elphick, 51 Baring Rd., Lee, London, S.E. 12; Alistair A. Miller, 91 Elmshurst Gardens, Tonbridge, Kent, and David A. Sawyer, 60 Bourne Vale, Hayes, Kent, all of England

Continuation of Ser. No. 302,407, Sep. 15, 1981, abandoned, which is a division of Ser. No. 154,199, May 29, 1980, abandoned. This application Mar. 5, 1984, Ser. No. 585,022

Claims priority, application United Kingdom, Jun. 1, 1979, 7919256

Int. Cl.[4] C07D *253/06;* **A61K** *31/53*

U.S. Cl. 514—242 **9 Claims**

1. 3,5-Diamino-6-(3-chloro-2-naphthyl)-1,2,4-triazine.

7. A method of treating convulsions in a mammal in need thereof comprising the administration of a non-toxic anticonvulsant effective amount of the compound of claim **1**.

4,560,688

TRICYCLIC ANTIHISTAMINES

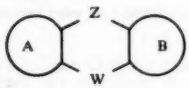
Frank J. Villani, West Caldwell, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 403,274, Jul. 29, 1982, Pat. No. 4,454,143, which is a division of Ser. No. 243,681, Mar. 16, 1981, Pat. No. 4,355,036, which is a continuation-in-part of Ser. No. 160,795, Jun. 19, 1980, Pat. No. 4,282,233. This application Feb. 8, 1984, Ser. No. 578,381

Int. Cl.[4] A61K *31/53;* **C07D** *253/08*

U.S. Cl. 514—243 **10 Claims**

1. A compound of the formula

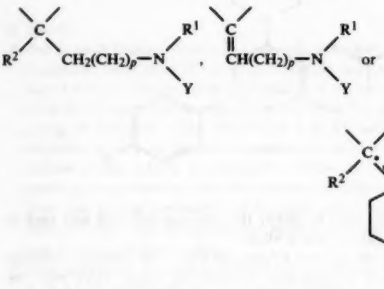


wherein

is a 5 or 6 membered ring which is an aromatic nitrogen heterocycle exclusive of pyridine;

is ortho-phenylene or halo-substituted ortho-phenylene; Z is a

bond or an alkylene chain of up to 2 carbon atoms in the chain, said 2 carbon chain optionally having one double bond, said chain optionally having either a carbonyl oxygen, or a hydroxy group as a substituent; W is



wherein n is 1 or 2 and p is 1 or 2, R^1 is C_1 to C_6 alkyl, R^2 is hydrogen or C_1 to C_3 alkyl, and the dotted line represents an optional double bond, R^2 being absent if the double bond is present, and Y is substituted carboxylate or substituted sulfonyl.

10. A method of effecting an anti-allergic response in an animal in need of such treatment comprising administering to the animal an effective amount of a compound as defined in claim **1**.

4,560,689

HETEROCYCLIC-FUSED PYRAZOLO-[3,4-D]PYRIDIN-3-ONES AS BENZODIAZEPINE RECEPTOR MODULATORS

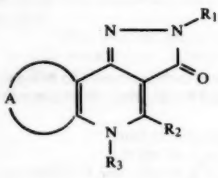
Naokata Yokoyama, Cliffside, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 457,105, Jan. 10, 1983, Pat. No. 4,479,955. This application Aug. 6, 1984, Ser. No. 638,322

Int. Cl.[4] **C07D** *471/12, 513/12, 498/12*

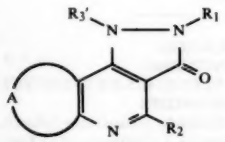
U.S. Cl. 514—250 **11 Claims**

1. A compound of the formula



(IA)

or



(IB)

wherein A together with the two carbon atoms to which it is attached represents a fused heterocyclic ring selected from (a) thieno, furo, and N-unsubstituted or N-lower alkyl substituted pyrrolo, wherein the carbon atoms in any of said rings are unsubstituted or one of them is substituted by lower alkyl, carbo-(lower)-alkoxy, halogen or trifluoromethyl; (b) N-unsubstituted or lower alkyl substituted-imidazo, wherein the carbon atom in said ring is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl; (c) thiazolo, oxazolo, isoxazolo, and pyridazino, wherein the carbon atoms forming any of said rings are unsubstituted or one or two are substituted by lower alkyl, lower alkoxy or halogen; (d) pyrimido and pyrazino wherein the carbon atoms in any of said rings are unsubstituted or one is substituted by lower alkyl or lower alkoxy; R_1 represents phenyl, or phenyl mono- or disubstituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl; or R_1 represents an aromatic heterocyclic radical selected from pyridyl, quinolyl, isoquinolyl, pyrimidyl and thiazolyl, or any said heterocyclic radical mono- or di-substituted by lower alkyl, lower alkoxy or halogen; R_2, R_3 and R_3' independently represent hydrogen or lower alkyl; or a pharmaceutically acceptable salt thereof.

9. An anxiolytic pharmaceutical composition suitable for oral or parenteral administration to mammals comprising an effective anxiolytically amount of a compound of claim **1** having anxiolytic activity in combination with one or more pharmaceutically acceptable carriers.

4,560,690

2-(N-SUBSTITUTED GUANIDINO)-4-HETERO-ARYLTHIAZOLE ANTIULCER AGENTS

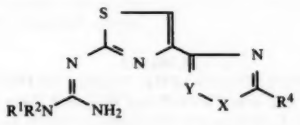
Lawrence A. Reiter, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,510

Int. Cl.[4] **C07D** *417/04, 417/14;* **A61K** *31/425*

U.S. Cl. 514—256 **27 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

X is NH and Y is CH or N, or

X is S and Y is CH;

R^1 is a straight or branched chain $(C_4–C_{10})$alkyl, $(R^3)_2C_6H_3$ or $(R^3)_2Ar(CH_2)_n$ where n is an integer from 1 to 4, the R^3 groups are the same or different and are H, F, Cl, Br, I, CH_3, CH_3O, NO_2, NH_2, OH, CN, COOR[5], or OCOR[5] and R^5 is $(C_1–C_3)$alkyl; and Ar is the residue of a phenyl, naphthyl, furyl, thienyl, pyridyl, pyrimidinyl, thiazolyl, or imidazolyl group;

R^2 is H or $(C_1–C_4)$alkyl;

or when R^1 and R^2 are taken together with the nitrogen atom to which they are attached, they form pyrrolidino, piperidino, morpholino or 4-methylpiperazino; and

R^4 is H, $(C_1–C_5)$alkyl, NH_2 or CH_2OH.

4,560,691

5-(PHENYL)-1,6-NAPHTHYRIDIN-2(1H)-ONES, THEIR CARDIOTONIC USE AND PREPARATION

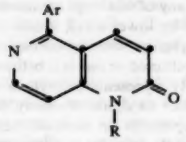
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jul. 13, 1984, Ser. No. 630,810

Int. Cl.[4] **A61K** *31/44;* **C07D** *213/50, 213/46, 471/04*

U.S. Cl. 514—300 **31 Claims**

1. 1-R-5-Ar-1,6-naphthyridin-2(1H)-one having the formula



or acid-addition or cationic salt thereof, where R is hydrogen or methyl and Ar is phenyl or phenyl substituted by a member selected from methyl, ethyl, methoxy, ethoxy, hydroxy, amino, acetylamino, methanesulfonylamino, bromo, chloro, fluoro, nitro, cyano or carbamyl.

24. A cardiotonic composition for increasing cardiac contractility which comprises a pharmaceutically acceptable carrier and, as the active component thereof, a cardiotonically effective amount of the 1-R-5-Ar-1,6-naphthyridin-2(1H)-one of claim **1** or pharmaceutically acceptable acid-addition or cationic salt thereof, where R is hydrogen or methyl and Ar is phenyl or phenyl substituted by a member selected from methyl, ethyl, methoxy, ethoxy, hydroxy, amino, acetylamino, methanesulfonylamino, bromo, chloro, fluoro, cyano or carbamyl.

4,560,692

4-PIPERIDINO-2-PHENYLQUINOLINES

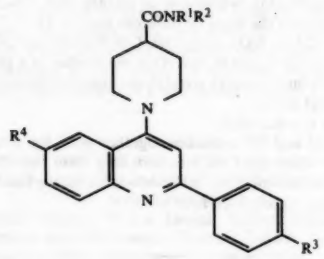
George F. Field, West Caldwell, and William J. Zally, Cresskill, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 18, 1984, Ser. No. 631,971

Int. Cl.[4] **A61K** *31/47;* **C07D** *215/16*

U.S. Cl. 514—313 **13 Claims**

1. A compound of the formula



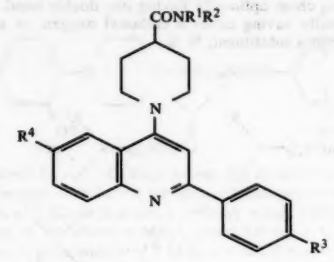
I

wherein:

R^1 and R^2 may be either the same or different and each is hydrogen or lower alkyl;

and wherein R^3 and R^4 may be either the same or different and each is hydrogen, halogen, or lower alkyl, with the proviso that R^3 and R^4 cannot both be hydrogen.

9. A method for treating convulsive seizures or anxiety which comprises administering, to a host requiring such treatment, a therapeutically effective amount of a compound of the formula



I

wherein:

R^1 and R^2 may be either the same or different and each is hydrogen or lower alkyl;

and wherein R^3 and R^4 may be either the same or different and each is hydrogen, halogen, or lower alkyl, with the proviso that R^3 and R^4 cannot both be hydrogen.

4,560,693

[1,3]-DIOXOLO[4,5-F]BENZIMIDAZOLES AND [1,4]-DIOXINO[2,3-F]BENZIMIDAZOLES

Georg Rainer, Constance, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

Filed May 1, 1984, Ser. No. 606,873

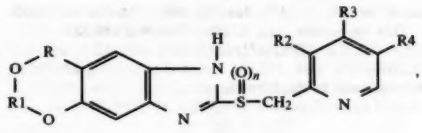
Claims priority, application Switzerland, May 3, 1983, 2402/83

Int. Cl.[4] **C07D** *491/056;* **A61K** *31/435*

U.S. Cl. 514—338 **22 Claims**

1. A tricyclic ether of formula I

(I)



wherein

R is a bond and

R1 is alkylene having 1 or 2 carbon atoms and being completly or partly substituted by fluorine, or chlorotrifluoroethylene, or

each of R and R1 is difluoromethylene,

R2 represents hydrogen or 1-3C-alkyl,

R3 represents hydrogen or 1-3C-alkyl or 1-3C-alkoxy,

R4 represents hydrogen or 1-3C-alkyl and

n represents the number 0 or 1, or

a salt thereof.

4,560,694

FUNGICIDAL ALKYLENE(CYCLOALKYLENE)-BIS-HETEROCYCLYL-BIGUANIDES

Siegfried Oeckl, Bergisch-Gladbach; Hans-Georg Schmitt, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

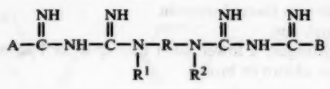
Filed May 20, 1983, Ser. No. 496,715

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221139; Jan. 29, 1983, 3303064

Int. Cl.[4] **A01N** *43/50, 43/64;* **C07D** *233/61, 249/08*

U.S. Cl. 514—359 **8 Claims**

1. An alkylene(cycloalkylene)-bis-heterocyclyl biguanide of the formula



in which

A and B each independently is a triazole, tetrazole, pyrazole, imidazole, benzotriazole or benzimidazole radical which is linked via a nitrogen atom and which is optionally substituted by at least one member selected from the group consisting of halogen, nitro, alkyl with 1 to 18 carbon atoms, alkylthio with 1 to 10 carbon atoms, and aryl with 6 to 10 carbon atoms which is optionally mono-, di-, tri-, tetra-, penta- or hexa-substituted by at least one substituent selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms and halogenoalkyl with 1 to 3 carbon atoms and up to 5 halogen atoms,

R is an optionally C_{1-6}-alkyl-substituted cycloalkylene radical with 5 to 9 carbon atoms, or a C_{1-20}-alkylene radical which is optionally substituted by C_{5-7}-cycloalkylene, C_{6-12}-bicycloalkylene, C_{9-18}-tricycloalkylene, oxygen, sulphur or the NR^3 group,

R^1 and R^2 each independently is hydrogen, C_{1-20}-alkyl or aralkyl which has 6 to 10 carbon atoms in the aryl part and 1 to 6 carbon atoms in the alkyl part and is optionally substituted by C_{1-6}-alkyl or halogen, and

R^3 is hydrogen, C_{1-6}-alkyl or optionally substituted aralkyl which has 6 to 10 carbon atoms in the aryl part and 1 to 6 carbon atoms in the alkyl part and is optionally substituted by C_{1-6}-alkyl or halogen,

or a salt thereof.

7. A method of combating fungi which comprises applying to said fungi or to a fungus habitat a fungicidally effective amount of a compound or salt according to claim 1.

4,560,695

ISOXAZOLYL AND ISOTHIAZOLYL AROMATASE INHIBITORS

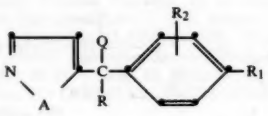
Kenneth S. Hirsch, New Palestine; Charles D. Jones; Harold M. Taylor, both of Indianapolis, and Mark A. Winter, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 18, 1984, Ser. No. 621,596

Int. Cl.[4] A61K *31/42, 31/425;* **C07D** *261/08, 275/02*

U.S. Cl. 514—372 **12 Claims**

1. A compound of the formula

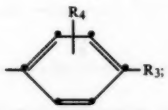


(I)

wherein:

A is S or O;

R is pyridyl or



Q is hydrogen, hydroxy, halo, or methyl; and

R_1, R_2, R_3, and R_4 are independently hydrogen, halo, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro, or trifluoromethyl, and pharmaceutically acceptable salts thereof.

4,560,696

ANALGESIC, ANTIPYRETIC OR ANTI-INFLAMMATORY IMIDAZOLE COMPOUNDS

Angelo Carenzi, Busto Arsizio; Dario Chiarino, Monza; Davide Della Bella, Milan; Viviana Frigeni, Monza, and Carlo Veneziani, Bresso, all of Italy, assignors to Zambon S.p.A., Milan, Italy

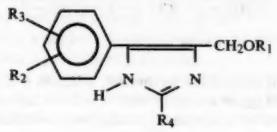
Continuation of Ser. No. 403,123, Jul. 29, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,243

Claims priority, application Italy, Jul. 31, 1981, 23270 A/81

Int. Cl.[4] A61K *31/415;* **C07D** *233/64*

U.S. Cl. 514—397 **5 Claims**

2. A pharmaceutical composition for analgesic, antipyretic or anti-inflammatory use containing an effective amount of a product of the formula



(I)

wherein

R_1 is selected from the group consisting of a straight or branched chain alkyl having from 1 to 4 carbon atoms, cyclohexyl, benzyl, 5-phenyl-imidazole-4-yl-methyl, phenyl optionally substituted by chlorine, methyl, methoxy or acetamino,

R_2 and R_3 are the same or different and each is selected from the group consisting of hydrogen, chlorine, methyl, methoxy, methylthio, methylsulfonyl,

R_4 is hydrogen or phenyl, or of a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier.

4,560,697

1,3-BIS-(1H-1,2,4-TRIAZOL-1-YL)-2-PERFLUORO-ALKYLPROPAN-2-OL ANTIFUNGAL AGENTS

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

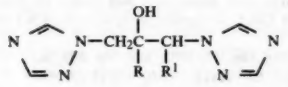
Filed Jan. 16, 1984, Ser. No. 571,218

Claims priority, application United Kingdom, Jan. 29, 1983, 8302500

Int. Cl.[4] A01N *43/64;* **A61K** *31/41;* **C07D** *249/08*

U.S. Cl. 514—383 **12 Claims**

1. A compound of the formula



(I)

or a pharmaceutically or agriculturally acceptable acid addition salt thereof, wherein R is a C_1–C_5 perfluoroalkyl group; and R^1 is H or CH_3.

9. A pharmaceutical composition comprising an antifungal or antileishmanial amount of a compound or a pharmaceutically acceptable salt according to claim 1 and a pharmaceutically acceptable diluent.

10. An agricultural antifungal composition suitable for use on a plant or seed which comprises an antifungal amount of a compound or agriculturally acceptable salt according to claim 1 and an agriculturally acceptable diluent.

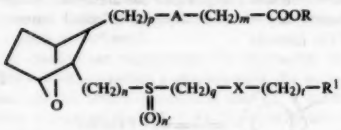
4,560,698

7-OXABICYCLOHEPTANE SUBSTITUTED THIO PROSTAGLANDIN ANALOGS AND THEIR USE IN THE TREATMENT IN THROMBOLYTIC DISEASE

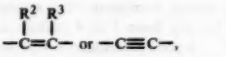
Steven E. Hall, Ewing Township, Mercer County, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 4, 1984, Ser. No. 617,201
Int. Cl.[4] A61K *31/34;* **C07D** *307/00*
U.S. Cl. 514—469 **16 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof, wherein p is 0 to 4; A is CH=CH, $(CH_2)_2$, or a single bond; m is 0 to 8; R is H, lower alkyl, alkali metal or tris(hydroxymethyl)aminomethane; n is 1 to 4; n' is 0, 1 or 2; q is 1 to 12; X is



wherein R^2 and R^3 may be the same or different and are H or lower alkyl; t is 0 to 5; and R^1 is H, lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and

$(CH_2)_p$, $(CH_2)_m$, $(CH_2)_n$, $(CH_2)_q$ and $(CH_2)_t$ can contain one or more lower alkyl substituents.

13. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

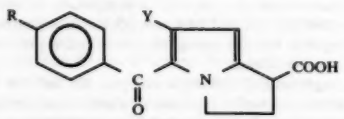
4,560,699

5-(4-VINYLBENZOYL)-1,2-DIHYDRO-3H-PYRROLO-[1,2-A]-PYRROLE-1-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF AND USE AS ANALGESICS AND ANTI-INFLAMMATORIES

Joseph M. Muchowski, Sunnyvale, and Stefan H. Unger, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 17, 1983, Ser. No. 458,243
Int. Cl.[4] A61K *31/40;* **C07D** *487/06*
U.S. Cl. 514—413 **5 Claims**

1. A compound selected from the group of those represented by the formula



and the pharmaceutically acceptable, non-toxic alkyl esters having from 1 to 12 carbon atoms and the pharmaceutically acceptable salts thereof wherein

R is vinyl, and

Y is hydrogen, a lower alkyl having from 1 to 6 carbon atoms, chloro or bromo.

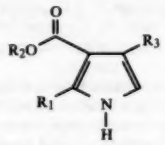
4,560,700

PYRROLE-3-CARBOXYLATE CARDIOTONIC AGENTS

Richard A. Schnettler; Richard C. Dage, both of Cincinnati, Ohio, and J. Martin Grisar, Wissembourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Feb. 8, 1985, Ser. No. 699,607
Int. Cl.[4] A61K *31/40, 31/44*
U.S. Cl. 514—423 **10 Claims**

1. A method for treating cardiac failure in a patient in need thereof which comprises administering to the patient a cardiotonically effective amount of a pyrrole-3-carboxylate of the formula



wherein R_1 is a hydrogen or lower alkyl; R_2 is a 1 to 8 carbon atom alkyl; and R_3 is a hydrogen, lower alkyl, pyridyl, pyridylmethyl, pyrryl, pyrrylmethyl, thienyl, thienylmethyl or phenyl or benzyl optionally substituted with one or two lower alkyl, lower alkoxy, lower alkylthio, halogen, nitro, hydroxy, carboxy or cyano groups or with a methylenedioxy group.

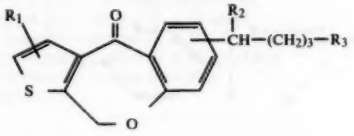
4,560,701

OXOTHIENOBENZOXEPINS, MEDICINAL USE, AND PROCESS FOR THE PREPARATION THEREOF

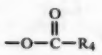
Lawrence L. Martin, Lebanon, and Linda L. Setescak, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 285,897, Jul. 23, 1981, Pat. No. 4,496,580. This application Jun. 13, 1983, Ser. No. 503,456
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] A61K *31/38;* **C07D** *327/04, 495/02, 333/38*
U.S. Cl. 514—443 **40 Claims**

1. A compound of the formula

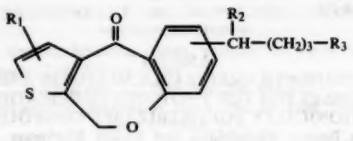


where R_1 is hydrogen or a straight or branched chain alkyl group having 1 to 5 carbon atoms, R_2 is hydrogen or a straight chain alkyl group having 1 to 5 carbon atoms, R_3 is OH or

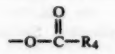


where R_4 is a straight or branched chain alkyl group having 1 to 10 carbon atoms, phenyl or trifluoromethyl.

24. A method of alleviating pain in a mammal by administering to a mammal a pain-alleviating effective amount of a compound having long duration of action and low ulcerogenicity, wherein said compound has the formula



wherein R_1 is hydrogen or a straight chain or branched chain alkyl group having 1 to 5 carbon atoms, R_2 is hydrogen or a straight chain alkyl group having 1 to 5 carbon atoms; and R_3 is OH or



wherein R_4 is a straight chain or branched chain alkyl group having 1 to 10 carbon atoms, phenyl or trifluoromethyl.

4,560,702
PESTICIDAL C_6–C_{25}-MERCAPTO-ORGANOTIN COMPOUNDS

Hartmut Ploss, Hamburg, Fed. Rep. of Germany, assignor to Norddeutsche Affinerie AG, Hamburg, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,058

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223335

Int. Cl.⁴ A01N *55/04*

U.S. Cl. 514—493 **8 Claims**

1. A pesticide for application to a plant site against mites or ticks containing an effective amount of a compound of the formula

$$(C_6H_{11})_3Sn—SR$$

wherein R is a branched or unbranched C_8 to C_{25} alkanyl chain or C_8 to C_{25} alkenyl chain, said alkanyl or alkenyl chain being unsubstituted or substituted by halo or nitro, along with a pesticidally acceptable carrier.

4,560,703
CLAVULONE DERIVATIVES, PROCESS FOR PREPARING THE SAME, AND USE OF SAID COMPOUNDS

Masanori Fukushima, Nagoya; Osamu Hirai, Toyonaka; Toshitaka Manda, Osaka; Hiroyuki Kikuchi, Nishinomiya; Yasumasa Tsukitani, Sakuramura; Iwao Shimizu, Toyonaka, and Yasuji Yamada, Hachioji, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

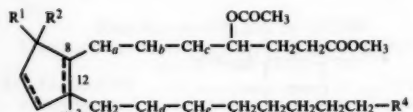
Filed Sep. 23, 1983, Ser. No. 535,258

Claims priority, application Japan, Sep. 27, 1982, 57-169148; Apr. 2, 1983, 58-58547; Jun. 22, 1983, 58-112378

Int. Cl.⁴ C07C *69/732, 69/738;* **A61K** *31/215*

U.S. Cl. 514—530 **15 Claims**

1. A substantially pure clavulone derivative of the formula:



[I]

wherein R^1 and R^2 combine together to form a keto group or either one of R^1 and R^2 is hydrogen atom and another one of them is hydroxy or acetoxy group, R^3 and R^4 are the same or different and are each hydrogen atom or acetoxy group, n is 0 or 1, provided that when the C—C bond between 8 and 12 positions is double bond, n is 0, a, b, c, d and e are each an integer of 1 or 2, and the dotted line means that the C—C bond is a single bond or double bond, or a salt thereof.

4,560,704
POLYAMINE BASED BONDED PHASE CHROMATOGRAPHY

Frederick E. Regnier, West Lafayette, Ind., and Shri P. Gupta, Ann Arbor, Mich., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Nov. 12, 1982, Ser. No. 441,057

Int. Cl.⁴ C08D *5/20;* **C08F** *30/08;* **C08G** *77/04*

U.S. Cl. 521—31 **33 Claims**

1. A process for producing a bonded support for a chromatographic system, said process comprising:

providing a support structure having an inorganic surface;

providing a preformed polyamine;

bonding a neutral organosilane to said inorganic surface with said neutral organosilane having a functional group sufficiently reactive so that said preformed polyamine reacts with said functional group to cause covalent bonding of said preformed polyamine through said functional group to said inorganic surface to form a stable inorganic polyamine matrix; and

attaching a ligand to said support matrix.

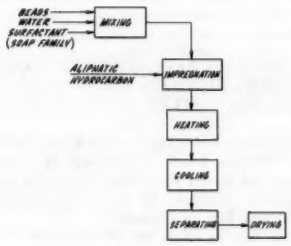
4,560,705
IMPREGNATING POLYSTYRENE BEADS WITH AN EXPANDING AGENT

James M. Harrison, Fort Worth, Tex., assignor to Texstyrene Plastics, Inc., Fort Worth, Tex.

Continuation of Ser. No. 603,887, Apr. 23, 1984. This application May 2, 1985, Ser. No. 729,895

Int. Cl.⁴ C08J *9/18*

U.S. Cl. 521—60 **5 Claims**



1. A method of impregnating polystyrene beads with an expanding agent to render the beads expandable, comprising the steps of preparing an impregnating solution including water, an expanding agent, and a suspending agent which includes a soap mixture of alkylaryl polyether alcohol and sodium dodecylbenzene sulfonate, introducing a certain amount of polystyrene beads into the solution, proportioning the beads and soap mixture on the basis of about 200 lbs. of beads to about 110–250 grams of alkylaryl polyether alcohol and about 2 grams to 15 grams of sodium dodecylbenzene sulfonate, enclosing the solution and beads in a stirred autoclave under pressure, maintaining the solution and beads under pressure in the autoclave for a selected time period and at a temperature and pressure suitable to cause the expanding agent to penetrate the beads, removing the beads and solution from the autoclave, and separating the beads from the solution.

4,560,706

METHOD OF PRODUCING POLYESTER FOAMS USING BOROHYDRIDE DISPERSIONS

Thomas M. Burton, Sarnia, and Helena Z. Kucharska, Rexdale, both of Canada, assignors to Fiberglas Canada Inc., Canada

Continuation-in-part of Ser. No. 607,046, May 4, 1984. This application Feb. 7, 1985, Ser. No. 699,276

Claims priority, application Canada, Dec. 12, 1983, 443119

Int. Cl.[4] C08J 9/06

U.S. Cl. 521—85 23 Claims

1. A method of making a foamed polyester resin comprising mixing a thermosetting liquid, unsaturated polyester, which is a condensation product of a polyhydric alcohol and a polycarboxylic acid, at least one of which is ethylenically unsaturated, with a liquid borohydride foaming agent selected from the group consisting of a liquid borohydride complex, a borohydride complex dissolved in an organic liquid medium and an inorganic borohydride salt dispersed in an organic rubber liquid medium which medium is at least substantially non-reactive with the borohydride salt, in the presence of a peroxide curing agent and a promoter.

4,560,707

HEAT-RESISTANT PHENOLIC RESIN FOAM

Sumio Iwase, Mie, Japan, assignor to Mitsubushi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1984, Ser. No. 629,462

Claims priority, application Japan, Jul. 11, 1983, 58-125685; Jul. 22, 1983, 58-133933

Int. Cl.[4] C08J 9/14

U.S. Cl. 521—124 4 Claims

1. A heat-resistant phenolic resole resin foam containing a hydrate of an inorganic compound which generates a water vapor at a temperature below the decomposition temperature of the phenolic resin foam, wherein

(a) the hydrate of the inorganic compound has a pH of not more than 6 as its saturated aqueous solution and is selected from the group consisting of $MgSO_4.4H_2O$, $Na_2SO_4.10H_2O$, $ZnSO_4.7H_2O$, $NaAl(SO_4)_2.12H_2O$, $KAl(SO_4)_2.12H_2O_2O$ and $Al_2(SO_4)_3.14–18H_2O$, and

(b) the hydrate of the inorganic compound is contained in an amount of 2 to 30% by weight in the phenolic resin foam.

4,560,708

POLYISOCYANURATE/POLYURETHANE ELASTOMERS BASED ON SUSPENSIONS OF CRYSTALLINE POLYESTERS AND POLYHYDROXYL COMPOUNDS

Peter Horn, Heidelberg; Anton Hesse, Weinheim; Walter Mann, Frankenthal; Wolfram Frank, Heidelberg; Matthias Marx, Bad Durkheim, and Walter Heckmann, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,444

Int. Cl.[4] C08G 18/14, 18/42

U.S. Cl. 521—137 10 Claims

1. A crystallite suspension comprising:

(a) as the dispersed phase, from 3 to 70 weight percent of a crystalline, ethylenically unsaturated polyester prepared through the condensation polymerization of fumaric acid and ethylene glycol in a molar ratio of from 1:1.2 to 1:2 wherein up to 18 mole percent of the fumaric acid may be replaced by other aliphatic, cycloaliphatic, and/or aromatic carboxylic acids and up to 20 mole percent of the ethylene glycol may be replaced by other mono-, di-, or trifunctional alcohols, said crystalline, ethylenically unsaturated polyester having a molecular weight factor per double bond of about 154 to 408; and

(b) as the coherent phase, from 30 to 97 weight percent of a polyhydroxyl compound having a functionality of from 2 to about 8, a hydroxyl number of from 20 to 800, and a melting point of less than 30° C., wherein said weight percents are based on the total weight of components (a) and (b).

4,560,709

PHOTOPOLYMERIZABLE MIXTURES AND PROCESSES FOR THE PHOTOPOLYMERIZATION OF CATIONICALLY POLYMERIZABLE COMPOUNDS

Godwin Berner, Rheinfelden, and Rudolf Kirchmayr, Aesch, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 419,120, Sep. 16, 1982, abandoned, which is a continuation of Ser. No. 261,424, May 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 236,464, Feb. 20, 1981, abandoned. This application Aug. 26, 1983, Ser. No. 526,516

Claims priority, application Switzerland, Feb. 29, 1980, 1628/80

Int. Cl.[4] C08F 2/50; C08J 3/28; C08G 59/68, 59/72

U.S. Cl. 204—159.14 9 Claims

1. A photopolymerizable mixture consisting essentially of

(a) an epoxide compound or a mixture of epoxide compounds, said epoxide compound containing no ethylenically unsaturated group,

(b) an aromatic iodonium salt as the polymerization catalyst, and

(c) an aromatic carbonyl compound as the cocatalyst which is a ketone of formula I

I

in which n is a 1 or 2 and Ar, if n is 1, is phenyl, diphenyl, tetrahydronaphthyl or phenyl which is substituted by one or more of the radicals F, Cl, Br, C_1–C_{12}-alkyl, —O—phenyl or —OAlk and, if n is 2, is C_6–C_{12}-arylene or a -phenylene-T-phenylene group in which T is —O—, —S— or —CH_2—, and Alk is C_1–C_4-alkyl, X is OH, R^1 is C_1–C_8-alkyl or —$CH_2CH_2COOAlk$ and R^2 is C_1–C_8-alkyl or allyl, or R^1 and R^2 together are C_4–C_7-alkylene.

4,560,710

DRAG REDUCTION AGENT

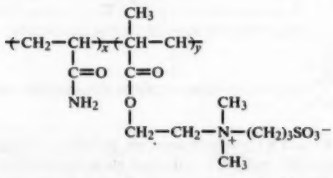
Donald N. Schulz, Annandale; Dennis G. Peiffer, East Brunswick; Ralph M. Kowalik, Bridgewater, and Jeffrey J. Kaladas, South Bound Brook, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 2, 1985, Ser. No. 688,235

Int. Cl.[4] B05D 5/08

U.S. Cl. 523—175 3 Claims

1. A method for reducing the frictional drag of an aqueous solution flowing through a pipe, tube or conduit having a continuous flow therethrough, which comprises the step of adding about 0.001 to about 0.1 wt. % of a copolymer to said aqueous solution, wherein said copolymer has the structure:



wherein x is about 40 to about 99 mole % and y is about 1 to about 60 mole %

4,560,711

TRANSPARENT ORGANOPOLYSILOXANE COMPOSITIONS

Toshio Suzuki, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,607
Claims priority, application Japan, Jan. 20, 1984, 59-8686
Int. Cl.[4] C08K 3/36
U.S. Cl. 523—212 6 Claims

1. A transparent organopolysiloxane composition consisting essentially of

(A) 100 parts by weight of organopolysiloxane having an average formula unit formula

$$R_aSiO_{(4-a)/2}$$

in which each R is a monovalent radical selected from the group consisting of hydrocarbon radicals, halogenated alkyl radicals, mercaptoalkyl radicals, glycidoxyalkyl radicals, methacryloxyalkyl radicals, hydroxyl radicals, alkoxy radicals, and hydrogen atom and in the total number of R in the organopolysiloxane, at least 50% are methyl and from 5 to 20% are phenyl, and a has an average value of 1.8 to 2.2, the organopolysiloxane having an index of refraction of 1.45 to 1.48 at 25° C., and a viscosity of from 0.01 to 50 Pa·s at 25° C., and

(B) from 0.5 to 50 parts by weight of a finely particulate silica which has been treated with a silane or polysiloxane which contains at least one hydroxyl radical or hydrolyzable radical and at least one phenyl radical per molecule, the silica having a treatment of from 0.5 to 60 weight percent based on the weight of the silica.

4,560,712

POLYPROPYLENE COMPOSITIONS CONTAINING BIMODAL CALCIUM CARBONATE AND A POLYSILOXANE

Alan W. Chiang, East Windsor, N.J., assignor to Mobil Oil Company, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,775
Int. Cl.[4] C08K 3/26
U.S. Cl. 523—220 17 Claims

1. A composition suitable for molding into a food container comprising:

(A) polypropylene;

(B) 5 to 50 weight percent of bimodal calcium carbonate of a particle size less than 50 microns the first major portion of which has a mean particle size which is significantly smaller than the second minor portion; and

(C) a polysiloxane.

4,560,713

REINFORCED PLASTIC MOLDING

Mitsuo Yoshihara; Yoshitada Morikawa; Yasuo Yamamoto; Mitsuharu Komada, and Masaaki Hattori, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 14, 1985, Ser. No. 690,809
Claims priority, application Japan, Jan. 13, 1984, 59-4999
Int. Cl.[4] C08L 63/10
U.S. Cl. 523—400 9 Claims

1. A reinforced plastic molding comprising a fibrous substrate having impregnated and cured therein a curable composition comprising

(a) tri(meth)acrylate of trishydroxyalkyl isocyanurate,

(b) a modified phenol novolak-based epoxy resin comprising a phenol novolak-based epoxy resin having introduced therein an acryloyl or methacryloyl group, and

(c) a polymerization initiator.

4,560,714

WATER-SWELLABLE CROSSLINKED POLYMERIC MICROGEL PARTICLES AND AQUEOUS DISPERSIONS OF ORGANIC FILM-FORMING RESINS CONTAINING THE SAME

Chandrasen Gajria, Louisville, Ky., and Yehuda Ozari, Arcadia, Calif., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 449,887, Dec. 16, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,464
Int. Cl.[4] C08K 3/20
U.S. Cl. 523—409 9 Claims

1. A process for preparing a stable aqueous dispersion of water-dispersible organic film-forming resin, comprising the steps of:

a. dissolving at least one water-dispersible organic film-forming resin in a water-miscible organic solvent to form a solution of said resin, wherein the film-forming resin is selected from the group consisting of heat-curable, thermosetting epoxy resins, phenolic resins, alkyd resins, polyester resins, aminoplast resins and mixtures thereof and wherein the organic solvent has a boiling of about 150° F. to about 500° F.;

b. separately preparing a stabilizer for said film-forming resin comprising water-swellable, crosslinked microgel particles having a stability in aqueous media of at least about one week when an aqueous dispersion of said microgel particles of about 20% solids content is maintained at 140° F. by polymerizing in an aqueous emulsion a monomer mixture comprising:

(i) a major amount of at least one polymerizable carboxylic acid group-free polymerizable vinyl monomer selected from the group consisting of polymerizable vinyl aromatic monomers, methacrylate ester monomers, nitrile monomers, vinyl halide monomers, mixtures thereof, and mixtures thereof with minor amounts of vinyl ester monomers and alkyl acrylate monomers,

(ii) from about 10 to 50%, based on the total monomer weight, of at least one polymerizable vinyl monomer selected from the group consisting of α,62 -ethylenically unsaturated carboxylic acid monomers and mixtures thereof, said carboxylic acid monomers being substantially non-gelling when copolymerized with said acid group-free monomers in an aqueous emulsion, and

(iii) from a small amount sufficient to crosslink the microgel particle up to about 5%, based on the total monomer weight, of a difunctional crosslinking monomer having at least two polymerizable double bonds;

c. adding and admixing together from about 10 to about 50% by weight, based on the total solids weight of the dispersion, of the microgel particles of step (b) to the solution of said film-forming resin;

d. at least partially neutralizing the admixture with ammonia or a volatile organic amine in an amount sufficient to provide a pH of about 2 to about 10 to said aqueous dispersion; and

e. dispersing the admixture into an aqueous medium to provide a stable aqueous resin dispersion having a total solids content of from about 15 to about 40 weight percent.

4,560,715

MICA FLAKE MASS AND RESIN COMPOSITION WITH THE SAME INCORPORATED THEREIN

Ryuhei Ueeda, Kurashiki; Kiyonobu Fujii, Mabi; Akira Kubotsu, Soja; Shunji Kaneda, and Kenji Okuno, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 14, 1984, Ser. No. 589,337
Claims priority, application Japan, Mar. 31, 1983, 58-56911; May 12, 1983, 58-83789
Int. Cl.[4] C08K 3/34
U.S. Cl. 523—443 9 Claims

1. A mass of mica flakes characterized by a median shape

factor of not less than 0.76, an average particle size of not more than 2,000 μm and an average aspect ratio of not less than 10.

6. A resin composition essentially comprising mica flakes characterized by a median shape factor of not less than 0.76, an average particle size of not more than 2,000 μm and an average aspect ratio of not less than 10 and a resin.

4,560,716

RUST PREVENTING EPOXY RESIN COMPOSITIONS

Shigeyuki Sato, Toyota, and Mitsumasa Matsushita, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Aug. 24, 1984, Ser. No. 643,921

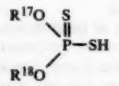
Claims priority, application Japan, Aug. 30, 1983, 58-158756; Sep. 9, 1983, 58-167175; Oct. 3, 1983, 58-185538; Oct. 5, 1983, 58-186201; Oct. 6, 1983, 58-188005; Oct. 6, 1983, 58-188006; Nov. 7, 1983, 58-208821; Nov. 19, 1983, 58-218454; Dec. 12, 1983, 58-234475; Dec. 15, 1983, 58-236530; Jul. 12, 1984, 59-145141; Jul. 18, 1984, 59-149246; Jul. 23, 1984, 59-152673; Jul. 26, 1984, 59-156320; Jul. 27, 1984, 59-158500

Int. Cl.[4] C08K *5/39, 5/49*

U.S. Cl. 523—451 47 Claims

1. An epoxy resin composition, comprising an epoxy resin, a hardener and a least one additive for forming a rust preventing film selected from the group consisting of:

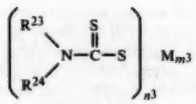
dithiophosphoric acids having the following chemical formula:



wherein R^{17} and R^{18} are the same or different and each represents alkyl, aryl or alkenyl having 1 to 24 carbon atoms,

dithiophosphoric acid derivaties selected from the group consisting of metal salts of dithiophosphoric acids amd ammonium salts of dithiophosphoric acids,

metal salts of dithiocarbamic acids having the following chemical formula:



wherein R^{23} and R^{24} are the same or different and each represents alkyl, aryl, alkenyl or aralkyl having 1–18 carbon atoms, or R^{23} and R^{24} may be taken together to form a ring, M represents a metallic element selected from zinc, molybdenum, iron, nickel, copper, lead, tellurium, and m^3 and n^3 are each an integer, and

oxidized waxes.

4,560,717

CATIONIC ELECTRODEPOSITABLE COMPOSITIONS CONTAINING FORMALDEHYDE SCAVENGER

Roger M. Christenson, Gibsonia; Joseph T. Valko, Pittsburgh; Joseph E. Plasynski, Arnold, and Roger L. Scriven, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 3, 1984, Ser. No. 627,587

Int. Cl.[4] C08K *5/21*

U.S. Cl. 523—456 14 Claims

1. An aqueous cationic electrodepositable composition which contains a positively charged film-forming resin and which contains a material which has methylol or substituted methylol groups and is prepared from a formaldehdye-reactive material and formaldehyde; said material containing free formaldehyde and/or being capable of generating free formaldehyde which lowers the pH of the cationic composition, said composition further containing a formaldehyde scavenger which is non-ionic and which does not become ionic in the cationic composition; said formaldehyde scavenger being present in an amount sufficient to stabilize the pH of the composition such that when the compositin is heated at 60° C. for 16 hours, the change in pH will be less than 0.3 pH units.

3. The composition of claim 1 in which the formaldehyde scavenger is water-soluble.

4. The composition of claim 3 in which the formaldehyde scavenger is an amide which is reactive with formaldehyde under aqueous conditions.

5. The composition of claim 4 in which the formaldehyde scavenger is urea.

4,560,718

HIGH SWELL GASKET MATERIAL

Stephen Ritchey, North Vernon, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 517,449, Jul. 26, 1983. This application Dec. 13, 1984, Ser. No. 681,081

Int. Cl.[4] C08L *1/00, 9/10;* C08K *3/40;* F02F *1/10*

U.S. Cl. 524—13 6 Claims

1. An internal combustion engine employing hydrocarbon oil containing fluids, comprising

a first engine part having a first gasket engaging face;

a second engine part having a second gasket engaging face, said second part located adjacent said first engine part for defining a gasket receiving space between said first and second gasket engaging faces;

at least one of said engine parts being formed to allow the gasket receiving space to be exposed to the hydrocarbon oil containing fluid;

biasing means for maintaining said first and second gasket engaging faces in a fixed position while subjecting material filling said gasket receiving space to a flange pressure at least as high as 10,000 psi;

said first and second gasket engaging faces allowing a non-fibrous ethylene propylene gasket filling said gasket receiving space to be extruded out of said space upon application of a gasket compressive force less than 10,000 psi; and

a gasket positioned between and in contact with said first and second gasket engaging faces in a manner allowing contact with the hydrocarbon oil containing fluids, said gasket comprising a fibrous material and an ethylene propylene rubber binder therefor and formed by a non-latex, compressed process in which non-latex ethylene propylene rubber binder in excess of 10 percent by weight and fibrous material in excess of 50 percent by weight are mixed and compressed into a sheet which when cured is capable of filling said gasket receiving space when placed therein and of preventing extrusion out of said gasket receiving space when said biasing means applies a gasket compressive force as high as 10,000 psi.

4,560,719

FLAME RETARDANT POLYOLEFIN-BASED RUBBER COMPOSITION

Tsutomu Nakamura, and Kunio Itoh, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,564

Claims priority, application Japan, Feb. 27, 1984, 59-35724

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—269 7 Claims

1. A flame-retardant polyolefin-based rubber composition which comprises:

(A) 100 parts by weight of a polyolefin-based synthetic rubber;

(B) from 1 to 100 parts by weight of an organopolysiloxane;

(C) from 1 to 100 parts by weight of a bromine-containing flame retardant agent or red phosphorus;

(D) from 5 to 200 parts by weight of aluminum hydroxide or magnesium hydroxide; and

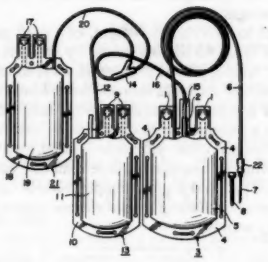
(E) from 0.5 to 20 parts by weight of zinc carbonate or manganese carbonate.

4,560,720

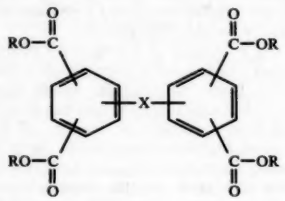
COMPOSITIONS OF POLYVINYL CHLORIDE AND TETRACARBOXYLIC TETRAESTERS AND MEDICAL ARTICLES THEREOF

Juuro Aoyagi, Tokyo; Toshiji Ichikawa, Chofu; Mikio Koide, Yamanashi, and Takeshi Shimomura, Kawasaki, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,355
Claims priority, application Japan, Oct. 20, 1982, 57-183002
Int. Cl.[4] C08K 5/10
U.S. Cl. 524—288 13 Claims



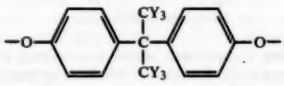
1. A composition for formulating medical articles comprising a body fluid preservation vessel, a catherter, a blood transfusion set, an aqueous infusion set, or a blood circuit, said composition comprising a polyvinyl chloride and a tetracarboxylic tetraester represented by the general formula I



(I)

wherein X is —O—, $-(CH_2)_n$ (in which n is an integer from 1 to 6), $-C(CH_3)_2-$, $-CH(CH_3)-$, —S—, $-CH(CF_3)-$, $-C(CF_3)_2-$,

—O—Ar—O— (in which Ar is an aryl group) or



(in which Y is H of F) and R is an aliphatic saturated hydrocarbon group containing from 4 to 18 carbon atoms.

4,560,721

PROCESS FOR PREPARING AN ETHER SOLUTION OF POLYAMIC ACIDS AND POLYIMIDE RESINS

Anatoli Onopchenko, Monroeville; Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 1, 1982, Ser. No. 394,260
Int. Cl.[4] C08L 61/00, 77/10
U.S. Cl. 524—378 10 Claims

1. A process for the preparation of a solution of an ether solvent having a boiling point at atmospheric pressure greater than about 100° C. and having the following formula:

$$R_1—O—(CH_2CH_2O)_n—R_2,$$

wherein n is an integer from 0 to 4 and R_1 and R_2 are alkyl radicals having from 1 to 10 carbon atoms and a diaminobenzophenone, which comprises subjecting a dinitrobenzophenone dissolved in said ether solvent to hydrogenation in contact with a continuous nickel catalyst to obtain said solution of diaminobenzophenone dissolved in said ether solvent, and reacting the solution of diaminobenzophenone with an aromatic dianhydride to obtain a polyamic acid solution.

4,560,722

STABILIZED (POLY)ESTER/(POLY)CARBONATE BLEND

John A. Tyrell, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 27, 1984, Ser. No. 644,781
Int. Cl.[4] C08K 3/38; C07C 68/08
U.S. Cl. 524—405 16 Claims

1. A composition comprising the reaction product of an aryl mono- or di-carboxylic acid or a reactive derivative thereof and an organic mono- or di-ol in the presence of an active catalyst in combination with the reaction product of phosgene or a reactive derivative thereof and an organic mono- or di-ol, stabilized against thermally-induced ester interchange reactions with boric acid.

4,560,723

CYANOACRYLATE ADHESIVE COMPOSITION HAVING SUSTAINED TOUGHNESS

George H. Millet, Oakdale; Edward R. Harrell, and Charles D. Wright, both of White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1983, Ser. No. 551,571
Int. Cl.[4] C08K 5/01, 5/02, 5/03
U.S. Cl. 524—486 5 Claims

1. A cyanoacrylate adhesive composition, comprising (a) cyanoacrylate monomer, (b) toughener comprising cyanoacrylate-compatible copolymer which comprises a thermoplastic polymer formed onto a rubbery polymer, wherein said toughener is treated to remove impurities which cause premature polymerization of cyanoacrylates and said toughener is selected from the group consisting of MBS, ABS or MABS copolymers, and (c) cyanoacrylate-compatible, toughener-compatible sustainer which provides improved retention of peel strength after heat aging of a cured bond of said adhesive composition, wherein said sustainer is selected from the group consisting of biphenyl, diphenylmethane, 4-bromochlorobenzene, 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, 1,3-dimethoxybenzene, nitrobenzene, benzonitrile, and acetophenone.

4,560,724

AQUEOUS POLYMER DISPERSIONS PREPARATION

Hartmut Brabetz; Herbert Eck; Reinhard Jira, and Heinrich Hopf, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,669

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323804

Int. Cl.[4] C08F *2/20, 4/28, 4/40, 2/38*

U.S. Cl. 524—734 9 Claims

1. A process for the preparation of aqueous polymer dispersions comprising polymerizing compounds with unsaturated ethylenic bonds at a temperature of 10° to 100° C. in the presence of an at least partially water-soluble free-radical initiator and at least one starch and or starch derivative and optionally present conventional adjuvants with the starting mixture containing not more than one third of the total nomomers and the remaining monomers being added during the polymerization, the initiators being at least one member of the group consisting of hydrogen peroxide, ketone peroxides and organic hydroperoxides in an amount of at least 30 mmol per kg of total monomer mixture and optionally present water-soluble reducing agents and the starch is water-soluble or gells in water and contains not more than 30% weight of amylose and the starch derivative is hydrolyzed starch in an amount of at least 0.6% by weight based on the total monomer weight.

4,560,725

POLYMER COMPOSITION BASED ON A POLYCARBONATE AND A GRAFT COPOLYMER

Petrus H. M. Van Bokhoven, Sweikhuizen, and Pieter J. Van Asperen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Licensing Subsidiary of DSM, Geleen, Netherlands

Filed Dec. 2, 1982, Ser. No. 446,420

Claims priority, application Netherlands, Dec. 2, 1981, 8105437

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 6 Claims

1. A polymer composition based on a polycarbonate and a graft copolymer of a vinyl aromatic compound and an unsaturated nitrile compound on a rubber-like polymer, wherein said composition consists essentially of:

A. at least one graft copolymer obtained by polymerizing 40–80 parts by weight of a monomer mixture, which mixture consists of:
   (1) 20–40 weight % of acrylonitrile, and
   (2) 60–80 weight % of styrene, in the presence of 20–60 parts by weight of a hydrocarbon rubber,

B. at least one graft copolymer obtained by polymerizing 75–90 parts by weight of a monomer mixture, which mixture consists of:
   (1) 20–40 weight % of acrylonitrile, and
   (2) 60–80 weight % of styrene, in the presence of 10–25 parts by weight of a hydrocarbon rubber,

C. a copolymer obtained by polymerizing 20–40 parts by weight of acrylonitrile with 60–80 parts by weight of styrene, and

D. at least one polycarbonate,

wherein all based on the weight of the composition, the total rubber content is from about 5 to about 30 weight % and the difference in rubber content between components A and B is at least 5 weight %.

4,560,726

POLYMER ALLOYS HAVING A MAT SURFACE

Herbert Eichenauer, Dormagen; Joachim Döring, Cologne; Karl-Heinz Ott, Leverkusen, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,865

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337940

Int. Cl.[4] C08L *51/04, 51/06*

U.S. Cl. 525—71 5 Claims

1. A polymer alloy of

(A) from 99.95 to 0.05%, by weight, of a graft product of a mixture of from 40 to 99.9 parts, by weight, of styrene, α-methyl-styrene, p-methyl-styrene, vinyl toluene, methyl methacrylate or mixtures thereof, from 40 to 0.1 parts, by weight, of a nitrogen base-containing compound having a vinyl substituent and from 0 to 49 parts, by weight, of acrylonitrile, grafted on a particulate rubber having an average particle diameter (d_{50}) of from 0.05 to 20.0 μm and a glass transistion temperature of ≦10° C. and the graft product having a total rubber content of from 5 to 80%, by weight, and

(B) from 0.05 to 99.95%, by weight, of a graft product of a mixture of from 40 to 99.9 parts, by weight, of styrene, α-methyl-styrene, p-methyl-styrene, vinyl toluene, methyl methacrylate or mixtures thereof, from 40 to 0.1 parts, by weight, of a mono- or di-acid or an anhydride thereof containing a polymerizable double bond and from 0 to 49 parts, by weight, of acrylonitrile grafted on a particulate rubber having an average particle diameter (d_{50}) of from 0.05 to 20.0 μm and a glass temperature of ≦10° C. and the graft product having a total rubber content of from 5 to 80%, by weight.

4,560,727

THERMOPLASTIC MOLDING COMPOSITION

J. Robert Crossan, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 18, 1983, Ser. No. 495,890

Int. Cl.[4] C08L *53/00*

U.S. Cl. 525—95 6 Claims

1. A high impact thermoplastic molding composition having improved oxidation stability comprising a physical blend of:

(a) 70 to 80 parts by weight of polystyrene;

(b) 10 to 15 parts by weight of a selectively hydrogenated block copolymer which, prior to hydrogenation, has at least two polystyrene blocks of molecular weight from about 5,000 to about 75,000 separated by at least one diene polymer block derived from butadiene or isoprene of molecular weight from about 30,000 to about 300,000, the polystyrene blocks comprising from about 25 to about 50% by weight of the total block copolymer, and the diene polymer block, after hydrogenation, being at least 90% saturated; and

(c) 10 to 15 parts by weight of low density polyethylene with a density in the range of from about 0.910 to about 0.925 g/cc.

4,560,728

THERMALLY CURED TOPCOATS ON VACUUM DEPOSITED METAL

Ronald J. Lewarchik, Arlington Heights, Ill., and Jeffrey W. Thompson, Centerville, Ohio, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Sep. 30, 1983, Ser. No. 537,694

Int. Cl.[4] C09D *3/72*

U.S. Cl. 525—123 15 Claims

1. A coating composition adapted to adhere to a chrome surface comprising, a solvent soluble hydroxy-functional acrylic copolymer including a copolymerized tertiary amine monomer in an amount of from 10% to 40% of the weight of the copolymer, and an organic polyisocyanate curing agent for

said soluble copolymer, said composition containing said copolymer and said polyisocyanate curing agent in amounts to provide an equivalent ratio of NCO:OH of from 1.2:1 to 0.5:1.

4,560,729

RUBBER COMPOSITION

Noboru Watanabe, and Yoichiro Kubo, both of Yokohama, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,684
Claims priority, application Japan, Oct. 19, 1983, 58-195412
Int. Cl.[4] C08F 279/02
U.S. Cl. 525—233 **11 Claims**

1. A rubber composition having improved steam resistance comprising a nitrile group-containing hydrocarbon rubber having an iodine number of not more than 120 and containing 10 to 60% by weight of units derived from an unsaturated nitrile, an organic peroxide vulcanizer and a crosslinking coagent selected from multiple unsaturated groups-containing monomers, polyfunctional oxime compounds and 1,2-polybutadiene, the amount of said crosslinking coagent being 8 to 30 parts by weight per 100 parts by weight of said rubber.

4,560,730

PROCESS FOR MAKING DIMERIZATION CATALYSTS

James D. Burrington, Richmond Heights; Robert K. Grasselli, Chagrin Falls; Fred Pesa, Aurora, and Elizabeth A. Maher, University Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 591,160, Mar. 19, 1984, abandoned, which is a continuation of Ser. No. 355,805, Mar. 8, 1982, abandoned. This application Nov. 21, 1984, Ser. No. 673,707
Int. Cl.[4] C08F 8/40
U.S. Cl. 525—340 **8 Claims**

1. A process for producing a catalyst comprising a polymer support having a ruthenium complex bonded thereto, the polymer support comprising an organic polymer backbone having trivalent P pendant atoms covalently bonded thereto and randomly distributed in the polymer, the ruthenium complex capable of catalyzing the dimerization of acrylonitrile to adiponitrile and/or 1,4-dicyanobutenes and comprising Ru and at least two homogeneous ligands having at least four ligating bonds bonding to the Ru, the Ru in each ruthenium complex datively bonding to a pendant atom in the polymer support, the Ru/pendant atom ratio in the catalyst being at least 0.001, the complex having on the average no more than one homogeneous phosphine ligand per atom of ruthenium, the process comprising contacting said polymer support with a liquid containing said ruthenium complex in a concentration of at least 10^{-6}M either (1) in separate batches, no more than 70 percent of the ruthenium complex being added to the polymer support at any one time, each batch addition taking place over a period of time of at least 6 minutes, or (2) continuously over a period of 2 to 50 hours, the amount of ruthenium complex contacting said polymer support being no less than one-tenth and no greater than ten times the amount of trivalent pendant atoms in said support on a molar basis.

4,560,731

PREPARATION OF ELASTOMERIC, CHLOROSULFONATED ETHYLENE POLYMERS

Mahmoud R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 514,337, Jul. 15, 1983, abandoned. This application May 14, 1984, Ser. No. 608,874
Int. Cl.[4] C08F 8/38
U.S. Cl. 525—344 **12 Claims**

1. A process of chlorosulfonating an ethylene polymer which consists essentially of reacting, in the absence of solvent or diluent, a granular ethylene-C_3 to C_8 alpha olefin polymer having a density of about 0.87 to about 0.93 gram per cc and a pore volume of about 0.1 to about 1 cc per gram and containing about 2.4 to about 20 mole percent said alpha olefin, with a gaseous chlorosulfonating agent to produce an elastomeric, granular, chlorosulfonated ethylene polymer having a tensile modulus of less than about 2,000 psi and a crystallinity of less than about 10 percent.

4,560,732

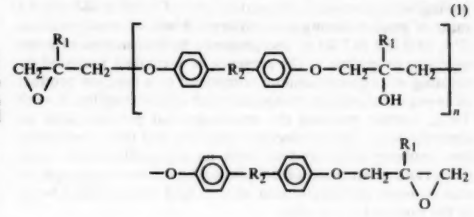
COATING COMPOSITION

Hidehiko Kojo, Koshigaya; Koji Akimoto, Tokyo, and Kazuhiro Urihara, Kasukabe, all of Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,250
Claims priority, application Japan, Nov. 11, 1983, 58-212200; Nov. 30, 1983, 58-226528
Int. Cl.[4] C08G 59/14
U.S. Cl. 525—481 **6 Claims**

1. A coating composition containing, as essential components, the high molecular weight reaction product of the reaction between;

(A) an epoxide resin having the following general formula (1);



(1)

wherein R_1 is H or CH_3; R_2 is —CH_2—or

and n is a number of from 5 to 30, and,

(B) at least one compound selected from the group consisting of:

(B-1) polynuclear polyhydroxy phenols having adjacent hydroxy groups,

(B-2) polyol esters of polyhydroxy phenolic carboxylic acids having adjacent hydroxy groups, and mixtures of (B-1) and (B-2);

wherein the molar ratio of (B-1) and/or (B-2) to (A) is such that hydroxy groups remain in the reaction product of (A) with (B-1) and/or (B-2), and said reaction product being dissolved or dispersed in an organic solvent.

4,560,733

POLYMERIZATION AND CATALYST

Shirley J. Martin nee Sturdy, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1984, Ser. No. 656,393
Int. Cl.[4] C08F 4/02, 10/02
U.S. Cl. 526—129 **6 Claims**

1. A method of producing a polymerization catalyst which comprises forming a component (A) by:

(1) contacting a first silica activated by calcining at a temperature in the range of about 600° to 900° C. and having a pore volume ranging from 1.5 to about 3 cc/g and surface area ranging from about 100 to about 300 m_2/g with dialkylmagnesium and $TiCl_4$,

(2) contacting a second silica activated by calcining at a temperature of about 100° to about 500° C. and having a pore volume of from about 0.3 to about 1 cc/g and a

surface area ranging from about 400 to about 900 m_2/g with dialkylmagnesium and $TiCl_4$,

(3) blending about equal amounts of said first and second silicas and subjecting the resulting blend to milling to form component (A), and

(4) combining component (A) formed in step (3) with a cocatalyst component (B) comprising trialkylaluminum.

4,560,734

POLYPROPYLENE FIBERS HAVING IMPROVED HEAT-SHRINKABILITY AND TENACITY

Kusuo Fujishita, Moriyama, and Hideshi Sakamoto, Ichihara, both of Japan, assignors to Chisso Corporation, Ohsaka, Japan

Filed Sep. 7, 1983, Ser. No. 529,997

Claims priority, application Japan, Sep. 7, 1982, 57-155752

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 526—142 **12 Claims**

1. Polypropylene fibers having an improved heat-shrinkability and tenacity, which comprises a polypropylene resin having a density of 0.905 g/cc or more, an isotactic pentad ratio of boiling n-heptane-insoluble portion (P_0) of 0.960 or more and a ratio of pentad having two different kinds of configurations (P_2), of 0.002 (0.2%) or less prepared by the process of polymerizing propylene in the presence of a catalyst prepared by reacting an organoaluminum compound or a reaction product of an organoaluminum compound with an electron donor, with $TiCl_4$, further reacting the resulting solid product with an electron donor and an electron acceptor, and them combining the resulting solid product with an organoaluminum compound and an aromatic carboxylic acid ester, the molar ratio of said aromatic carboxylic acid ester to said solid product being in the range of 0.2 to 10.0.

4,560,735

PROCESS FOR PREPARING COPOLYMER

Masao Nakagawa, Kobe; Kiyoshi Mori, Kakogawa, and Toshiaki Sugita, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,759

Claims priority, application Japan, Mar. 29, 1984, 59-63063; Mar. 29, 1984, 59-63064; Mar. 29, 1984, 59-63065

Int. Cl.⁴ C08F *4/36*

U.S. Cl. 526—232.3 **4 Claims**

1. A process for preparing a copolymer which comprises copolymerizing by bulk or suspension polymerization 10 to 80% by weight of α-methylstyrene, 5 to 50% by weight of acrylonitrile and 0 to 70% by weight of at least one member selected from the group consisting of styrene, chlorostyrene, paramethylstyrene, t-butylstyrene, acrylic ester and methacrylic esters in the presence of a difunctional organic peroxide having two —O_2— groups capable of producing radicals and a 10 hour half-life temperature of 60° to 120° C. and being capable of producing a t-butoxy radical as an initiator at a temperature of 80° to 135° C.

4,560,736

WATER-THINNABLE COATING COMPOSITIONS FROM AMINOALKYL CARBOXYLATE HYDROHALIDE POLYMERS

James W. Pischke, Midland, Mich.; Russell T. McFadden, Freeport, Tex.; Ruben L. Krause, Angleton, Tex., and Charles H. Moore, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 11, 1983, Ser. No. 493,410

Int. Cl.⁴ C08F *2/00, 120/34, 126/00*

U.S. Cl. 526—312 **11 Claims**

1. A process for preparing water-dispersible polymers from an acid salt of a primary aminoalkyl ester of a monounsaturated monocarboxylic acid and at least one other ethylenically unsaturated comonomer, said process comprising (a) dissolving said acid in a water-miscible coupling solvent to form a first monomer solution, (b) mixing said comonomers to form a second monomer material, (c) bringing said first monomer solution and said second monomer material together at a polymerization rate controlled to that at which interpolymerization proceeds and at which the concentration of unpolymerized monomers is maintained at a level to maintain a solution, (d) adding said monomer stream (a) and monomer stream (b) continuously, and at rates such that the completion of addition of both streams is simultaneous, and (e) polymerizing to substantial completion.

4,560,737

PIEZOELECTRIC POLYMERIC MATERIAL

Kazuhiko Yamamoto; Kazumi Nejigaki, both of Tokyo; Takashi Yasumura, Fujimi; Chikashi Kawashima, and Shuichi Inoue, both of Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Dec. 30, 1983, Ser. No. 567,177

Claims priority, application Japan, Jan. 6, 1983, 58-709

Int. Cl.⁴ C08L *27/16*

U.S. Cl. 527—72 **10 Claims**

1. A piezoelectric polymeric material which is the product of a process comprising the steps of

(1) providing a sheet or film comprising a mixture of

(a) 100 parts by weight of a homopolymer of vinylidene fluoride and

(b) between 1 and 100 parts by weight of a copolymer prepared by graft copolymerizing or block copolymerizing (i) a monomer comprising at least 50% by weight of vinylidene fluoride monomer and (ii) a fluoroelastomer, such that the proportion of said vinylidene fluoride in said monomer to said fluoroelastomer is in the range from 1:100 to 100:100 by weight;

(2) stretching said sheet or film at a temperature below the melting temperature of said mixture; and

(3) after said stretching has commenced, polarizing said sheet or film, thereby making the stretched sheet or film an electret.

4,560,738

PEST-COMBATING AGENT HAVING INCREASED DURATION OF ACTION

Roland Richter, Cologne; Paul Reinecke, Leverkusen; Hanns P. Müller, Odenthal; Gerhard Bonse, Cologne, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

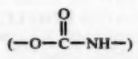
Filed Aug. 19, 1983, Ser. No. 524,955

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3232917; Oct. 15, 1982, 3238358

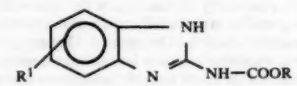
Int. Cl.⁴ C07C *125/06*

U.S. Cl. 528—62 **14 Claims**

1. A pest-combating agent of prolonged activity comprising the reaction product of a pest-combating agent having at least one hydrogen atom active in a Zerewitinoff reaction other than a hydrogen atom which is part of a carbamic acid ester group



with a polyether isocyanate, the reaction with the polyether isocyanate taking place on said other hydrogen atom, the pest-combating agent being of the formula



in which
R is C_{1-4}-alkyl, and
R^1 is C_{1-6}-alkyl or hydrogen.

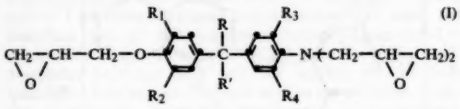
4,560,739

TRIGLYCIDYL COMPOUNDS OF AMINOPHENOLS

Abdul-Cader Zahir, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,074
Claims priority, application Switzerland, Dec. 2, 1983, 6467/83
Int. Cl.⁴ C08G *59/28, 59/02*
U.S. Cl. 528—99 **10 Claims**

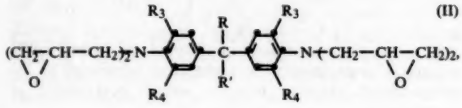
1. A triglycidyl compound of the formula I



(I)

wherein each of R and R′ independently is a hydrogen atom, C_1–C_6alkyl, phenyl, cyclohexyl or cyclopentyl, and each of R_1, R_2, R_3 and R_4 independently is a hydrogen atom, a halogen atom or C_1–C_6alkyl.

5. An epoxy resin mixture containing (a) a triglycidyl compound of the formula I according to claim 1 and (b) a tetraglycidyl compound of the formula II



(II)

wherein R, R′, R_3 and R_4 are as defined for formula I, the ratio of the epoxy equivalents of (a) to (b) in said mixture of epoxy resins being 10:1 to 1:10.

4,560,740

METHOD FOR PRODUCING AROMATIC POLYESTERS

Katsuji Ueno, Hirakata; Hiroaki Sugimoto, Takatsuki, and Kazuo Hayatsu, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 2, 1984, Ser. No. 606,378
Claims priority, application Japan, May 12, 1983, 58-83728
Int. Cl.⁴ C08G *63/18, 63/60*
U.S. Cl. 528—125 **6 Claims**

1. In a process for preparing aromatic polyesters wherein there is reacted (A) a compound selected from the group consisting of aromatic dicarboxylic acids and their derivatives and (B) a compound selected from the group consisting of aromatic dihydroxy compounds and their derivatives, or (A), (B) and (C) a compound selected from the group consisting of aromatic hydroxycarboxylic acids and their derivatives, the improvement comprising carrying out the reaction in a reaction system containing, together with (A), (B) and optionally (C), an organic carboxylic acid anhydride and a quinone compound (D) and/or a complex between (B) and (D).

4,560,741

POLYESTER RESINS CAPABLE OF FORMING CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Burns Davis, and Robert B. Barbee, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,577
Int. Cl.⁴ C08G *63/16*
U.S. Cl. 528—302 **10 Claims**

1. A polyester composition capable of being formed into molded containers having good gas barrier properties comprising the reaction product of
(A) a diol containing up to about 8 carbon atoms, and
(B) a diacid component comprising
(i) about 5 to 95 mole percent of oxydiacetic acid, and,
(ii) about 5 to about 95 mole percent of naphthalene dicarboxylic acid,
wherein said polyester has an inherent viscosity of about 0.5 to 1.5.

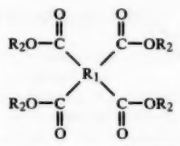
4,560,742

HIGH TEMPERATURE RESISTANT POLYIMIDE FROM TETRA ESTER, DIAMINE, DIESTER AND N-ARYLNADIMIDE

Ruth H. Pater, Rocky River, Ohio, assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 13, 1982, Ser. No. 434,087
Int. Cl.⁴ C08G *69/26*
U.S. Cl. 528—342 **3 Claims**

1. A composition of matter consisting essentially of a mixture of compounds of the formulas:



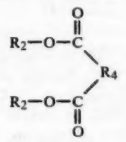
(a)

wherein R_1 is a tetravalent aryl radical and R_2 is alkyl or hydrogen; and at least two of R_2 being alkyl;

(b)

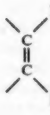
$$H_2N—R_3—NH_2$$

wherein R_3 is a divalent aryl radical;

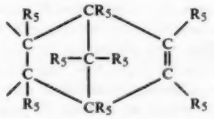


(c)

wherein R_2 is as defined in (a) and at least one R_2 is aklyl, and R_4 is divalent radical of the formula:

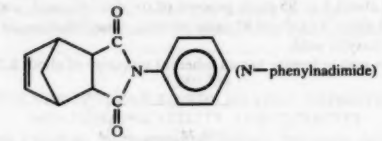


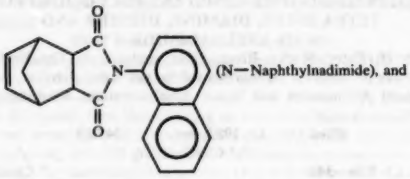
or

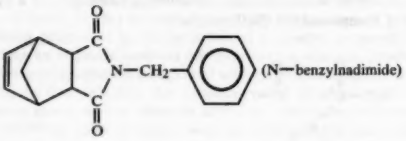


wherein R_5 is hydrogen or lower alkyl; and wherein the molar ratio of a:b:c is n:(n+1):2 wherein n has a value from 1 to 20, and (d) an N-arylnadimide present in an

amount of about 0.5 to 10% by weight of the total composition said N-arylnadimide being selected from the group consisting of;







4,560,743

POLY(P-PHENYLENETEREPHTHALAMIDE) FIBERS

Takashi Fujiwara, and Tamio Ishitobi, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1984, Ser. No. 646,115

Claims priority, application Japan, Sep. 2, 1983, 58-160405

Int. Cl.[4] C08G *20/20*

U.S. Cl. 528—348 **2 Claims**

1. A poly(p-phenyleneterephthalamide fiber consisting essentially of poly(p-phenyleneterephthalamide) having an inherent viscosity of at least 5 dl/g as determined at 25° C. in sulfuric acid having a concentration of 98% by weight at a polymer concentration of 0.5 g/dl, said fiber being composed of single filaments of 0.5 to 3 denier, wherein the single filament tensile strength is at least 35 g/denier, the macrovoid number, defined below, is not more than 10 per 100 mm, and the asymmetry, defined below, is not more than 0.2, the macrovoid number being the number of voids having a size of at least about 1 μm, that can be counted when optional 20 single filaments of said fiber are selected and each single filament is observed along a length of 5 mm from an optional point by an optical microscope at 400 magnifications, with the proviso that in case of a void elongated in the direction of the fiber axis, the number of portions having an increased width is regarded as the number of macrovoids, and the asymmetry being the value obtained by determining a W-shaped interference fringe of the single filament by using a quantitative transmittance type interference microscope using polarized light vibrating in a direction perpendicular to the fiber axis, measuring the absolute value of the difference between the angle ABC and the angle ACB in the interference fringe having apexes A, B and C, A being the central apex, with respect to at least 20 points in optional 5 single filaments selected from the fiber and dividing the number of the measuring points where the absolute value of the angle difference is at least 20° by the number of all the measuring points.

4,560,744

AZO DYE 2:1-CHROMIUM COMPLEXES

Hans Baumann, Wachenheim, and Klaus Grychtol, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

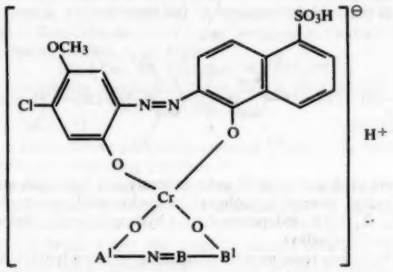
Filed Mar. 6, 1981, Ser. No. 241,105

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010872

Int. Cl.[4] C09B *45/06, 45/16, 46/00;* **D06P** *1/10*

U.S. Cl. 534—696 **2 Claims**

1. A metal complex dye, which in the form of the free acid has the formula:



wherein A^1 is a benzene or naphthalene nucleus substituted by at least one substituent selected from the group consisting of chlorine, bromine, methyl, ethyl, C_1–C_4-alkoxy, trifluoromethyl, nitro, C_1–C_4-alkylsulfonyl, phenylsulfonyl, unsubstituted or substituted carbamyl or sulfamyl and hydroxysulfonyl, and B^1 is naphthalene or naphthalene substituted by hydroxysulfonyl, chlorine, bromine, amino, acetylamino or phenylamino.

4,560,745

PREPARATION OF DYES WHICH CONTAIN SULFONIC ACID GROUPS AND HAVE A LOW ELECTROLYTE CONTENT

Volkmar Weberndoerfer, Mannheim; Friedrich Brunnmueller, Ludwigshafen; Manfred Eisert, Ludwigshafen, and Rudolf Bermes, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 263,007

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045377

Int. Cl.[4] C09B *69/02, 69/04, 67/42, 67/44*

U.S. Cl. 534—728 **5 Claims**

1. A process for the preparation of concentrated aqueous fluid formulation of dyes which contain sulfonic acid groups and have a low electrolyte content, wherein an aqueous solution or suspension, which may or may not contain inorganic salts, of the dye containing sulfonic acid groups is, in the absence of solvent

(a) mixed, at elevated temperature above 50° C., with an amount, approximately stoichiometrically to the sulfo groups of the dye, of a non-emulsifying, water-insoluble amine of a total of 12 to 40 carbon atoms, which forms, with the said dye, a liquid salt which is sufficiently lipophilic that it separates from the aqueous phase,

(b) the pH is brought to <3 with an acid and the batch is mixed thoroughly,

(c) the two resulting phases of different density are separated, and

(d) the phase which consists of the lipophilic ammonium salt of the dye is mixed, with or without prior washing with water, with a water-soluble base whose sulfonate salt is to be prepared, and with water, the resulting phases are

mechanically separated, and the salt is left in the aqueous solution or is isolated therefrom.

4,560,746

ULTRAFILTRATION PROCESS FOR PURIFICATION OF DYES USEFUL IN FOODSTUFFS

Robert W. J. Rebhahn, Berkley, Mass., and Wayne L. Cook, Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Continuation-in-part of Ser. No. 481,038, Mar. 28, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 677,118

Int. Cl.[4] C09B *29/16, 67/54, 69/00*

U.S. Cl. 534—840 17 Claims

1. In a process for the purification of a dye selected from the group consisting of the disodium salt of 1-[(6-methoxy-4-sulfo-3-methylphenyl)azo]-2-naphthol-6-sulfonic acid, the disodium salt of 1-[(4-sulfophenyl)azo]-2-naphthol-6-sulfonic acid, the trisodium salt of 1-[1-(4-sulfonaphthyl)azo]-2-naphthol-3,6-disulfonic acid, the disodium salt of 2-[1-(4-sulfonaphthyl)azo]-1-naphthol-4-sulfonic acid and the sodium salt of 2-(2-quinolyl)-1,3-indanedione-sulfonic acid as the products resulting, respectively, from the diazotization of 5-methoxy-2-methylsulfanilic acid in water with sodium nitrite in the presence of hydrochloric acid followed by the coupling under alkaline conditions of the resulting 5-methoxy-4-sulfo-2-methylphenyldiazonium chloride with sodium 2-naphthol-6-sulfonate; the diazotization of sulfanilic acid in water with sodium nitrite in the presence of hydrochloric acid followed by the coupling under alkaline conditions of the resulting 4-sulfophenyldiazonium chloride with sodium 2-naphthol-6-sulfonate; the diazotization of 4-aminonaphthalene-1-sulfonic acid in water with sodium nitrite in the presence of hydrochloric acid followed by the coupling under alkaline conditions of the resulting 1-sulfonaphthyl-4-diazonium chloride with disodium 2-naphthol-3,6-disulfonate; the diazotization of 4-aminonaphthalene-1-sulfonic acid in water with sodium nitrite in the presence of hydrochloric acid followed by the coupling under alkaline conditions of the resulting 1-sulfonaphthyl-4-diazonium chloride with sodium 1-naphthol-4-sulfonate; and the condensation of 2-quinaldine with phthalic anhydride followed by sulfonation of the resulting 2-(2-quinolyl)-1,3-indanedione, said dye being present in the resulting reaction mixtures, along with impurities, the improvement which comprises: subjecting an aqueous solution of the reaction mixture resulting from said coupling or said sulfonation to ultrafiltration through a membrane having a nominal pore diameter of 5–15 Angstroms under a hydrostatic pressure of approximately 200 to 400 p.s.i.g., at a pH from approximately 6.0 to 9.0, to thereby cause separation of said impurities from said dye, said impurities of a molecular size smaller than the nominal pore diameter passing into the permeate on the downstream side of said membrane and said dye remaining in the concentrate, and when substantially all said impurities have been removed from said concentrate, as evidenced by their essential absence in said permeate, recovering said dye, in approximately 90% purity from said concentrate by evaporation of said concentrate to dryness.

4,560,747

PROCESS FOR PRODUCING GRANULATES OF WATER-SOLUBLE DYES BY FLUIDIZED BED GRANULATION

Beat Bruttel, Böckten; Hansjörg Schneider, and Werner H. Dörfel, both of Reinach, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,885

Claims priority, application Switzerland, Oct. 30, 1979, 9702/79

Int. Cl.[4] C09B *46/00;* D06P *5/02, 1/64*

U.S. Cl. 534—887 27 Claims

1. A process for producing a granulate of water-soluble dyes, in which process at least one granulating auxiliary having a softening point or softening range of between 30° and 150° C. and selected from the group consisting of

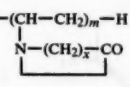
(a) at least one compound of the formula I

$$A—(CH_2CH_2O)_n—H \quad (I)$$

in which A is the group R—O— or

wherein R is an aliphatic or alicyclic hydrocarbon group having 8 to 22 carbon atoms, R′ is an aliphatic hydrocarbon group having 8 to 22 carbon atoms, and n is 10 to 200,

(b) a mixture of a compound of the formula II



(II)

in which m is 50 to 500, and x is 3 to 5, with a compound of the formula III

$$R_1—NH—CO—NH—R_1 \quad (III)$$

in which each R_1 independently of the other is hydrogen or methyl, and

(c) a mixture of a compound of the formula I with at least one compound of the formula II and III, is sprayed onto a fluidised bed containing at least one water-soluble dye and, the granulating auxiliary or both, the granulating auxiliary or auxiliary mixture being heated, before its addition, during the time it is in the fluidised bed or both, to above its softening point or softening range.

4,560,748

STREPTOTHRICIN-GROUP COMPOUNDS

Shigezo Udaka, Nagoya; Shigeyoshi Miyashiro, Yokohama; Kazuo Hirayama, Tokyo; Toshihiko Ando, Kawasaki; Asao Murai, Tokyo; Tsuyoshi Shiio, Kamakura; Takao Kida, Yokosuka, and Hiroshiro Shibai, Chigasaki, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

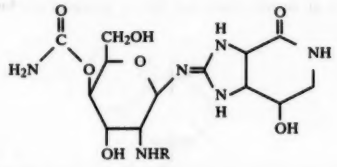
Filed Jun. 3, 1983, Ser. No. 500,908

Claims priority, application Japan, Jun. 7, 1982, 57-97406

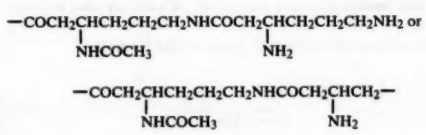
Int. Cl.[4] C07H *17/00*

U.S. Cl. 536—24 1 Claim

1. A streptothricin-group compound having the following formula:



in which R represents



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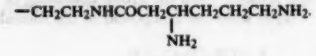


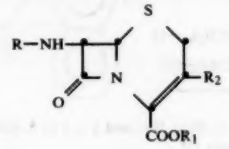
4,560,749

CEPHEM-3-IMIDATES AND 3-AMIDINES

Douglas O. Spry, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

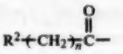
Filed Nov. 18, 1983, Ser. No. 552,960
Int. Cl.[4] C07D *501/18*
U.S. Cl. 544—16 **20 Claims**

1. A compound of the formula

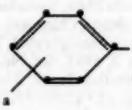


wherein R is hydrogen or an acyl group of the formula

wherein R^1 is C_1–C_4 alkyl, C_1–C_4 alkyl substituted by halogen or cyano;
or R is an aroyl or aralkanoyl group of the formula



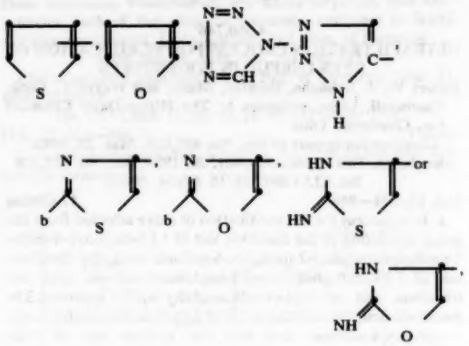
wherein R^2 is phenyl or a mono-substituted phenyl group of the formula



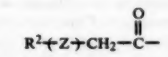
wherein a is halogen, amino, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, cyano, hydroxymethyl, aminomethyl, carboxamido, carboxymethyl, or C_1–C_4 alkoxycarbonylmethyl;
or R^2 is a di- or tri-substituted phenyl group of the formula

wherein a', a'', and a''' are independently hydrogen, halogen, hydroxy, C_1–C_4 alkyl, or C_1–C_4 alkoxy; and n is 0 or 1;
or R is a heteroarylalkanoyl group of the formula

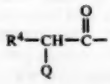
wherein R^3 is



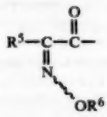
wherein each b is amino, protected amino, C_1–C_3 alkyl or phenyl;
or R is an aryloxyacetyl or arylthioacetyl group of the formula



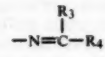
wherein R^2 has the same meanings as defined above and Z is O or S;
or R is an α-substituted aralkanoyl or heteroarylalkanoyl substituted group of the formula



wherein R^4 is R^2, as defined above, and in addition is thienyl, furyl, or 1,4-cyclohexadienyl; Q is hydroxy, formyloxy, carboxy, the sulfo group —SO_3H, or amino;
or R is an oximino-substituted aralkanoyl or heteroarylalkanoyl group of the formula



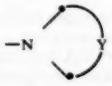
wherein R^5 is R^2 and R^3 as each is defined above, and R^6 is hydrogen or C_1–C_3 alkyl;
R_1 is hydrogen or a carboxy protecting group; R_2 is a group of the formula



wherein R_3 when taken separately is C_1–C_4 alkyl or C_1–C_4 alkyl substituted by phenyl or phenyl substituted by one or two C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, carboxy, carboxamido, or cyano groups;
R_4 when taken separately is C_1–C_4 alkoxy, C_1–C_4 alkylthio, phenoxy, phenoxy substituted by one or two C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, carboxy, carboxamido, or cyano groups, phenylthio and phenylthio substituted by one or two C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, carboxy, car-

boxamido, or cyano groups; or R_4 is an amino group of the formula

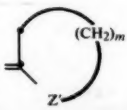
wherein R_4' and R_4'' are independently C_1–C_4 alkyl, phenyl or phenyl substituted by one or two C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, carboxy, carboxamido, or cyano groups, and R_4' and R_4'' when taken together with the nitrogen atom to which they are attached form a 5–6 membered heterocyclic ring of the formula



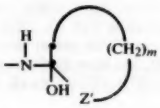
wherein Y is $(-CH_2-)_n$ or $-CH_2-Y'-CH_2-$, wherein n is 2 or 3 and Y' is O, S, or

wherein Y'' is hydrogen, C_1–C_4 alkyl, or benzyl;

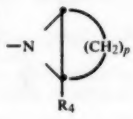
R_3 and R_4 when taken together with the carbon atom to which they are attached form a 5–7 membered ring of formula



wherein Z' is O or S and m is 2 to 4; or R_2 is a group of the formula



wherein m and Z' have the same meanings as defined above; or R_2 is a bicyclic aziridine group of the formula



wherein p is 3 to 5, and R_4 has the same meanings as defined above;

and when R_1 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

4,560,750

CEPHEM COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Kunio Atsumi; Kiyoaki Katano, both of Yokohama; Fumio Kai, Fujisawa; Ken Nishihata, and Eiichi Akita, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

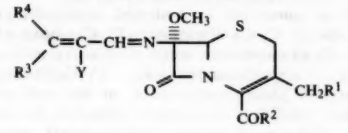
Filed Apr. 9, 1982, Ser. No. 367,016

Claims priority, application Japan, Apr. 13, 1981, 56-54275

Int. Cl.⁴ C07D *501/57;* **A61K** *31/545*

U.S. Cl. 544—21 **7 Claims**

1. A cephem compound of the formula:



wherein R^1 represents a hydrogen atom or a group of —A—B in which A is an oxygen atom or a sulfur atom and B is an acyl group selected from the group consisting of an acetyl group and an acetoacetyl group; a heterocyclic group selected from the group consisting of a 1H-tetrazol-5-yl group, a 1-methyl-1H-tetrazol-5-yl group, a 1-carboxymethyl-1H-tetrazol-5-yl group, a 2-carboxymethyl-1H-triazol-5-yl group, a 1-sulfoethyl-1H-tetrazol-5-yl group, a 2-carboxymethyl-1-methyl-1H-triazol-5-yl group, a 1-sulfoethyl-1H-tetrazol-5-yl group, a 2-carboxymethyl-1-methyl-1H-triazol-5-yl group, a 4-methyl-5-oxo-6-hydroxy-4,5-dihydro-1,2,4-triazin-3-yl group, a pyridiniummethyl group, a triazolyl group and a thiadiazolyl group; or a carbamoyl group; R^2 is a hydroxy group or a carboxyl-protecting group; R^3 and R^4 may be the same or different and each represent a hydrogen atom, a lower alkyl group or a phenyl group; Y represents a halogen atom.

4,560,751

PREPARATION OF N,N-DISUBSTITUTED 2-AMINOTHIAZOLES

Guenther Seybold, Neuhofen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

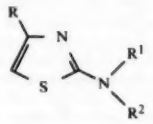
Filed Jun. 30, 1983, Ser. No. 509,428

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 3227329

Int. Cl.⁴ C07D *277/42*

U.S. Cl. 544—60 **14 Claims**

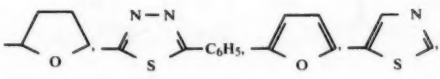
1. A process for the preparation of an N,N-disubstituted 2-aminothiazole of the formula I



I

where R is

an alkyl group of 1 to 10 carbon atoms which may be substituted by fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkylmercapto, phenoxy, phenylmercapto, nitro, C_2–C_4-alkanoylamino, C_1–C_4-dialkylamino, phenyl,



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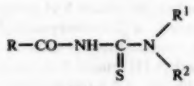
or

an aryl radical which is naphthyl or phenyl which is monosubstituted or polysubstituted by C_1–C_8-alkyl, C_1–C_4 alkoxy, dialkylamino, β-cyano-ethoxy, β-C_1–C_8-alkoxycarbonylethoxy, C_1–C_4-alkylmercapto, phenylmercapto, chlorine, bromine, nitro or C_1–C_4-alkanoylamino, and

R^1 and R^2 are each C_1–C_8-alkyl which can be interrupted by oxygen or substituted by hydroxyl, cyano, chlorine, C_1–C_4-alkoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoylamino, acetyl, C_1–C_4-alkylaminocarbonyloxy, arylaminocarbonyloxy, C_1–C_4-alkoxycarbonyloxy, or phenoxycarbonyloxy, or are each allyl, methallyl, propargyl, cyclohexyl, phenyl-C_1–C_5-alkyl, phenoxyethoxypropyl, phenyl, methoxyphenyl, ethoxyphenyl or tolyl, or

R^1 and R^2 together with a nitrogen are pyrrolidino, piperidino, morpholino, piperazino, α-methylpiperazino, hexamethyleneimino or thiomorpholino S-dioxide,

wherein a compound of the formula II



II

where R, R^1 and R^2 are defined as in formula I, is reacted with a water-soluble monohaloacetate in an aqueous alkaline medium.

4,560,752

PHOSPHINATES OR PHOSPHONATES USEFUL FOR CONTROL OF WEEDS

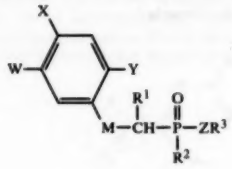
Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 585,742, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 518,520, Jul. 29, 1983, abandoned. This application Jun. 28, 1984, Ser. No. 625,394

Int. Cl.[4] C07D *273/00*

U.S. Cl. 544—66 **27 Claims**

1. A compound of the following formula (A):

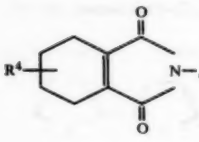


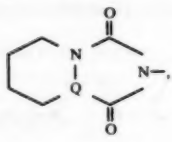
(A)

wherein,

M is oxygen, sulfur, sulfinyl or sulfonyl;

W is selected from the groups





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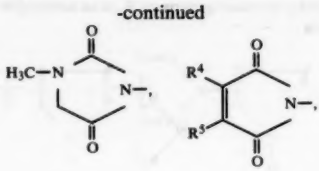
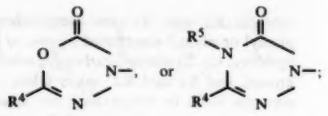




Q is N or CH;

each of X and Y is independently hydrogen or halogen;

Z is O, S or NR′;

each of R′ and R^1 is hydrogen or lower alkyl;

R^2 is lower alkyl or lower alkoxy;

R^3 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, alkoxyalkyl, alkylthioalkyl, alkoxycarbonylalkyl or dialkylaminocarbonylalkyl; and

each of R^4 and R^5 is independently hydrogen or lower alkyl.

4,560,753

2-SUBSTITUTED-PYRIDO[2,3-D]PYRIMIDIN-5(8H)-ONES

George Y. Lesher, Schodack; Baldev Singh, and Stanley C. Laskowski, both of East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

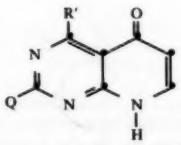
Continuation-in-part of Ser. No. 439,361, Nov. 5, 1982, Pat. No. 4,432,981. This application Oct. 12, 1983, Ser. No. 541,199

The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.

Int. Cl.[4] C07D *487/04;* **A61K** *31/505*

U.S. Cl. 544—279 **5 Claims**

1. 2-Q-4-R′-pyrido[2,3-d]pyrimidin-5(8H)-one having the formula



or acid-addition or alkali or alkaline earth metal salt thereof, where Q is 4(or 3)-hydroxyphenyl, 4(or 3)-methoxyphenyl, 4(or 3)-pyridinyl or 4(or 3)-pyridinyl having one or two lower-alkyl substituents, and R′ is hydrogen or alkyl having from one to four carbon atoms.

4,560,754
SUBSTITUTED 5-PHENYL-5-(AMINOALKYL)-1,3-DIAZABICYCLO[4.4.0]DECAN-4-ONES AND 5-PHENYL-5-(AMINOALKYL)-1,3-DIAZABICYCLO[4.4.0]DEC-2-EN-4-ONES

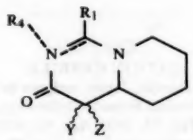
Gilbert W. Adelstein, Evanston, and Robert J. Chorvat, Arlington Heights, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 532,120, Sep. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 424,936, Sep. 27, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 635,989

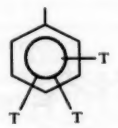
Int. Cl.⁴ C07D *471/04;* A61K *31/505*

U.S. Cl. 544—282 **35 Claims**

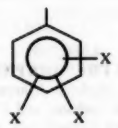
1. A compound of the Formula:



wherein R_1 is:
(a) hydrogen;
(b) alkyl of from 1 to 6 carbon atoms, inclusive: or
(c)



wherein Y is:



wherein each T is a substituent taken independently, selected from the group consisting of:
(a) hydrogen;
(b) halogen;
(c) alkyl of from 1 to 6 carbon atoms, inclusive;
(d) alkoxy of from 1 to 6 carbon atoms, inclusive; or
(e) phenyl;
wherein each X is a substituent taken independently, selected from the group consisting of:
(a) hydrogen;
(b) halogen;
(c) alkyl of from 1 to 6 carbon atoms, inclusive;
(d) alkoxy of from 1 to 6 carbon atoms, inclusive; or
(e) phenyl;
wherein Z is $—(CH_2)_n—NR_2R_3$, wherein n is 1 to 6;
wherein R_2 and R_3 are
alkyl of from 1 to 6 carbon atoms, inclusive, R_2 and R_3 each being the same or different;
wherein R_4 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive; with the proviso that R_4 is present only where the adjacent ring nitrogen atom is not doubly bonded in the optional ring double bond; or the pharmacologically acceptable salts.

4,560,755
ISOQUINOLINESULFONYL DERIVATIVES WHICH POSSESS A RELAXATORY ACTION

Hiroyoshi Hidaka, 799-25, Kannonji-cho, Tsu-shi, Mie-ken, Japan; Takanori Sone, Nobeoka, Japan; Yasuharu Sasaki, Nobeoka, Japan, and Taisuke Sugihara, Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Hiroyoshi Hidaka, both of, Japan

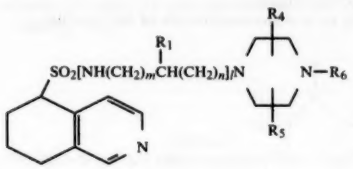
Division of Ser. No. 357,770, Mar. 12, 1982, Pat. No. 4,456,757. This application Jan. 20, 1984, Ser. No. 572,419

Claims priority, application Japan, Mar. 20, 1981, 56-39550; Jun. 1, 1981, 56-82559; Jan. 12, 1982, 57-2229; Jan. 14, 1982, 57-3291

Int. Cl.⁴ C07D *401/12;* A61K *31/495*

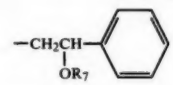
U.S. Cl. 544—363 **8 Claims**

1. A compound of Formula (I):



(I)

wherein
l is zero or one;
m and n each is zero or an integer of one to nine;
m+n is an integer of at least one;
R_1 is a hydrogen atom, a C_{1-10} alkyl group, a C_{5-6} cycloalkyl group or a phenyl group;
R_4 and R_5 each is a hydrogen atom, a C_{1-10} alkyl group, an phenyl group or an phenylalkyl group and R_6 is a hydrogen atom, a C_{1-10} alkyl group, an phenyl group, an phenylalkyl group, a benzoyl group, a cinnamyl group, a cinnamoyl group, a furoyl group or a



group wherein R_7 is a C_{1-8} alkyl group;
or the pharmaceutically acceptable acid addition salt thereof.

4,560,756
2-AMINOPYRAZINES AND THE PREPARATION OF 2-AMINOPYRAZINES AND PYRAZINES

Fritz Brunnmueller, Limburgerhof, and Michael Kroener, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

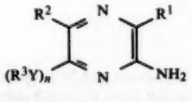
Filed Nov. 2, 1983, Ser. No. 547,852

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242195

Int. Cl.⁴ C07D *241/18, 241/20*

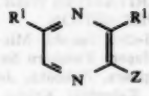
U.S. Cl. 544—408 **9 Claims**

1. A process for the preparation of a mixture of a 2-aminopyrazine of the formula



Ia

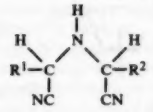
with a pyrazine of the formula



Ib

where the individual groups R^1 and R^2 can be identical or different and are each hydrogen, alkyl of 1 to 20 carbon atoms or said alkyl substituted by alkoxy and/or alkylthio, alkenyl of 2 to 20 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, alkylaryl or aralkyl of 7 to 12 carbon atoms or phenyl, R^3 is alkyl of 1 to 8 carbon atoms, or cycloalkyl or aralkyl of up to 8 carbon atoms, Y is oxygen or sulfur, Z is the group YR^3, where Y and R^3 have the above meanings, and n is 0 or, when R^1 and/or R^2 is said alkyl substituted by alkoxy and/or alkylthio, then n is 1, which process comprises:

cyclizing an α-iminodiacetonitrile of the formula



II

where R^1 and R^2 have the above meaning, by reaction with an alcohol and/or a thioalcohol of the formula

HYR^3 IV

where Y and R^3 have the above meanings, in the presence of an alkali metal compound and/or an alkaline earth metal compound.

4,560,757

9-AZABICYCLO(3.3.1) NONANE INTERMEDIATES FOR COMPOUNDS USEFUL IN THE TREATMENT OF CNS DISORDERS

Michael S. Hadley, Sawbridgeworth, and Francis E. Blaney, London, both of England, assignors to Beecham Group p.l.c., England

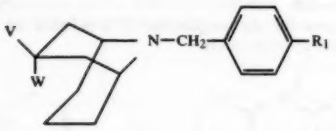
Division of Ser. No. 432,028, Sep. 30, 1982, Pat. No. 4,472,413. This application Sep. 9, 1983, Ser. No. 530,513

Claims priority, application United Kingdom, Oct. 1, 1981, 8129717; Nov. 28, 1981, 8135970; Jun. 19, 1982, 8217835; Jul. 7, 1982, 8219721

Int. Cl.[4] C07D *457/14*

U.S. Cl. 546—112 **1 Claim**

1. A compound of formula (XVII):



(XVII)

wherein V is amino or C_{1-6} alkanoylamino and W is hydrogen or V and W together with the carbon atom to which they are attached are an oximino group, and R_1 is fluoro.

4,560,758

PROCESS FOR PREPARING PYRROLO[1,2-A]IMIDAZOLES AND IMIDAZO[1,2-A]PYRIDINES

Thomas A. Davidson, and Robert J. Murray, both of Penfield, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 518,514, Jul. 29, 1983, Pat. No. 4,507,481. This application Nov. 23, 1984, Ser. No. 674,380

Int. Cl.[4] C07D *471/00*

U.S. Cl. 546—121 **3 Claims**

1. A process for preparing a 3-aryl or a 2,3-diaryl-2,5,6,7-tetrahydro-3H-pyrrolo[1,2-a]imidazole or a 3-aryl or a 2,3-diaryl-2,3,5,6,7,8-hexahydroimidazo[1,2-a]pyridine which comprises (a) contacting the acid addition salt of the corresponding cyclic methylthioimine with a 2-aryl or a 2,3-diarylaziridine and (b) recovering from the resultant reaction mixture the desired compound.

4,560,759

CATION CARRIER

Kazuhisa Hiratani, Ibaraki, Japan, assignor to Director-General of Agency of Industrial Science-Technology, Tokyo, Japan

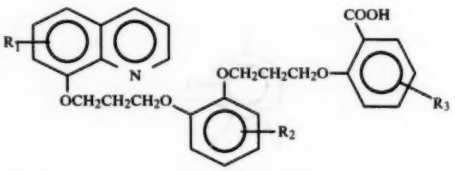
Filed Feb. 25, 1983, Ser. No. 470,016

Claims priority, application Japan, Feb. 25, 1982, 57-30134

Int. Cl.[4] C07D *215/26*

U.S. Cl. 546—178 **10 Claims**

1. A polyether having the following general formula:



wherein R_1, R_2 and R_3 each stand for hydrogen or an alkyl group having from 1 to 30 carbon atoms.

4,560,760

PROCESS FOR THE PREPARATION OF A LACTAM

Roland E. van der Stoel, Buchten; Marcel A. R. Bosma; Petrus H. J. Janssen, both of Geleen, and Cornelis G. M. van de Moesdijk, Elsloo, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

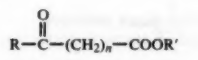
Continuation of Ser. No. 442,974, Nov. 19, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,049

Claims priority, application Netherlands, Nov. 21, 1981, 8105278

Int. Cl.[4] C07D *201/08*

U.S. Cl. 546—243 **7 Claims**

1. A process for preparing a lactam which consists essentially in the reductive amination, in the gas phase, of an oxoalkane carboxylic acid ester having the formula



wherein R is an alkyl group having from 1 to 4 carbon atoms, R' is cycloalkyl, an alkyl group of from 1 to 3 carbon atoms or benzyl and n varies from 2 to 3, and wherein the reaction is carried out:

A. in an atmosphere of hydrogen, and

B. in the presence of a reactant, in the gas phase selected from the group consisting of gaseous ammonia and a vaporized primary amine, and

C. in the presence of a hydrogenation catalyst metal selected

from groups IB and VIIIB of the Periodic Table, or compounds thereof, promoted with sodium.

4,560,761

QUATERNARY AMMONIUM COMPOUNDS CONTAINING AN ANHYDRIDE GROUP

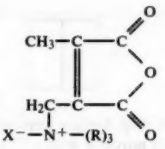
Ellis K. Fields, River Forest, and Mark L. Winzenburg, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 484,541, Apr. 13, 1983, Pat. No. 4,526,986. This application Apr. 30, 1984, Ser. No. 605,425

Int. Cl.[4] C07D *405/06, 307/60*

U.S. Cl. 546—283 5 Claims

1. A quaternary ammonium compound of the structural formula:



wherein X is halogen and R is selected from the group consisting of alkyl moieties of from 1 to 20 carbon atoms, cycloalkyl moieties of from 5 to 12 carbon atoms, heterocyclic moieties selected from the group consisting of pyridine, quinoline, isoquinoline, phenanthridine and N-methylpyrrolidine and aryl moieties containing from 6 to 18 carbon atoms.

4,560,762

2-ALKYLAMINOPYRIDINE DERIVATIVES

Kenji Tsuzuki, Shinnanyo, and Hideo Morinaka, Utsunomiya, both of Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Shinnanyo, Japan

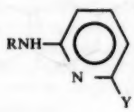
Filed May 23, 1983, Ser. No. 497,408

Claims priority, application Japan, May 27, 1982, 57-88828; May 27, 1982, 57-88829; Jul. 7, 1982, 57-116888; Jul. 9, 1982, 57-118619; Jul. 9, 1982, 57-118620; Apr. 28, 1983, 58-73857

Int. Cl.[4] C07D *213/74, 213/64*

U.S. Cl. 546—297 5 Claims

1. 2-alkylaminopyridine derivatives represented by the general formula



wherein R denotes a lower alkyl group of C_1 to C_3 and Y denotes a methoxy group.

4,560,763

BASE PRECURSOR FOR HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

Kozo Sato, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

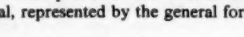
Filed Mar. 30, 1984, Ser. No. 595,121

Claims priority, application Japan, Mar. 31, 1983, 58-55700

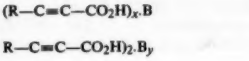
Int. Cl.[4] C07D *213/55;* C07C *69/52, 69/76;* G03C *5/24, 1/00*

U.S. Cl. 546—341 5 Claims

1. A base precursor for heat-developable photosensitive material, represented by the general formula (I) or (II):



(I)



(II)

wherein, R represents a monovalent group selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, an alkenyl group, an alkynyl group, an aryl group, a substituted aryl group, a heterocyclic group, a substituted heterocyclic group, an aralkyl group, a substituted aralkyl group, an acyl group, an alkoxycarbonyl group, a carbamoyl group, a substituted carbamoyl group, $—CO_2M$ (M is an alkali metal) and $—CO_2H.B$, or a divalent group selected from the group consisting of a substituted or unsubstituted alkylene group, a substituted or unsubstituted arylene group and a substituted or unsubstituted heterocyclic divalent group;

B represents an organic base;

x represents 1 when B is a monoacidic base, and 2 when B is a diacidic base; and

y represents 2 when B is a monoacidic base, and 1 when B is a diacidic base.

4,560,764

SYNTHESIS OF AN IMIDAZOLYL ISOTHIOUREA

Michitaro Fujimoto, Tondabayashi; Giichi Funazo, Toyonaka; Hirokazu Seki, Nara; Shuhei Takamatsu, Sakai, and Takeshi Sakai, Nara, all of Japan, assignors to Fujimoto Pharmaceutical Corporation, Osaka, Japan

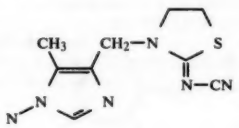
Filed Jun. 27, 1983, Ser. No. 508,180

Claims priority, application Japan, Aug. 19, 1982, 57-143566

Int. Cl.[4] C07D *417/06*

U.S. Cl. 548—190 1 Claim

1. An isothiourea derivative of the formula:



4,560,765

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Yoshiharu Nakai, Otsu, and Kazuo Sakane, Amagasaki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

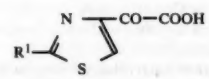
Division of Ser. No. 291,777, Aug. 10, 1981, Pat. No. 4,440,766, which is a division of Ser. No. 772,734, Feb. 28, 1977, Pat. No. 4,303,655. This application Jan. 18, 1984, Ser. No. 571,700

Claims priority, application United Kingdom, Mar. 9, 1976, 9425/76; Oct. 4, 1976, 41145/76

Int. Cl.[4] C07D *277/44, 277/46, 277/48*

U.S. Cl. 548—194 8 Claims

1. A compound of the formula:



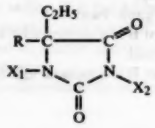
wherein R^1 is amino or amino, protected by an eliminatable protective group, or its carboxylic ester with a protective eliminatable esterifying group or a salt thereof.

4,560,766
SHAPED HALOGENATED HYDANTOINS

Theodore A. Girard, Williamsport, and Lloyd C. Franklin, Montgomery, both of Pa., assignors to Glyco Chemicals, Inc., Williamsport, Pa.

Filed Feb. 9, 1983, Ser. No. 465,175
Int. Cl.[4] C07D *233/72*
U.S. Cl. 548—311 14 Claims

1. A method of producing a non-dusting solid, shape retentive form of halogenated hydantoin, said method comprising the step of forming into a solid shaped product a non-dusting and free-flowing hydantoin having the formula



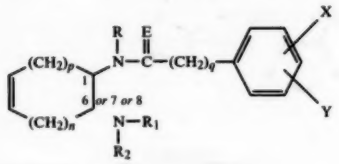
wherein R is methyl or ethyl and X_1 and X_2 which may be the same or different is chlorine or bromine.

4,560,767
N-(2-AMINO-CYCLOALKENYL)BENZENEACETAMIDE AND -BENZAMIDE ANALGESICS AND TRITIATED KAPPA AGONISTS THEREFROM

John M. McCall, Kalamazoo, and Robert A. Lahti, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jun. 17, 1983, Ser. No. 505,527
Int. Cl.[4] C07D *205/04, 207/08, 207/20, 241/04*
U.S. Cl. 548—578 15 Claims

1. A compound of the formula



(I)

wherein

p and n are the integers 1 or 2 so that the resulting cycloalkenyl ring has from 6 to 8 ring carbons;

the wavy line (~) bond between the 6-(or 7- or 8-)position ring carbon atom and the nitrogen indicates that the bond can be either cis- or trans- with respect to the 1-substituent of the cycloalkenyl ring;

q is 0 or 1;

E is oxygen or bivalent sulfur;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35; trifluoromethyl, nitro, C_1 to C_3-alkyloxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, $—NH_2$, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxacylamino ($—NHC(O)R_4$), sulfonic acid ($—SO_3H$), C_1 to C_3-alkanoyl, (C_2 to C_5-alkenyl)$CH_2—O—$ and benzoyl;

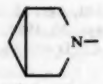
R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken together with the nitrogen to which they are bonded complete

(a) a 1-azetidinyl or 1-pyrrolidinyl ring further unsubstituted or substituted in the 3-position of the ring with the hydroxy, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy or C_1 to C_3-alkanoyloxy;

(b) a 2,5-dihydro-1H-pyrrol-1-yl ring of the formula

(c) a 3-azabicyclohexan-3-yl of the formula



(d) a 3-azabicycloheptan-3-yl ring of the formula

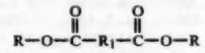
(e) a 1-piperazinyl ring, further unsubstituted or substituted on the 4-position nitrogen with a C_1 to C_3-alkyl; and R_4 is hydrogen or C_1 to C_2-alkyl, and the acid addition salts thereof.

4,560,768
POLYIMIDO-ESTER COMPOUNDS AND THERMOSET RESIN COMPOSITIONS CONTAINING SAME

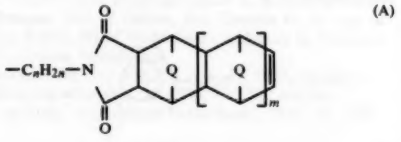
Robert E. Hefner, Jr., and Douglas L. Hunter, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1983, Ser. No. 562,333
Int. Cl.[4] C07D *403/12*
U.S. Cl. 548—435 5 Claims

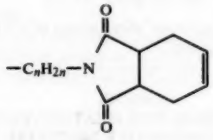
1. An polyimido-ester compound having the formula



wherein R is selected from one of the following groups



(A)



(B)

and R_1 is a divalent radical selected from one of the following groups

I. $—C(X)=CH—$

II. $—CH_2—C(=Y)—$

III. $—CH=C(Z)—CH_2—$

wherein

n = 1–6

m = 0–4

X = hydrogen or methyl

Y = methylene or isopropylidene

Z = hydrogen or —COOR

Q=methylene.

4,560,769

PREPARATION OF PYRROLES

Helmuth Menig, Friedelsheim; Martin Fischer, Ludwigshafen, and Karl Baer, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

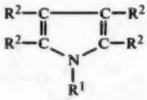
Filed Mar. 9, 1984, Ser. No. 588,119

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309355

Int. Cl.[4] C07D *207/323, 295/00*

U.S. Cl. 548—560 12 Claims

1. A process for the preparation of a pyrrole of the formula



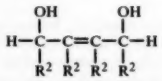
I

where the individual radicals R^1 and R^2 can be identical or different and are each hydrogen or alkyl with 1 to 8 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, alkylaryl or aralkyl with 7 to 12 carbon atoms or phenyl, which process comprises:

reacting 0.1 to 10 moles of ammonia or an amine of the formula

II

where R^1 has the above meanings, with 1 mole of a but-2-ene-1,4-diol of the formula



III

where R^2 has the above meanings, in the gas phase, at a temperature from 180° to 500° C., and in the presence of a metal catalyst selected from the group consisting of silver and a mixture of silver and palladium, said catalyst being applied to a carrier, and said catalyst being used in an amount, calculated as total metal without carrier, corresponding to 0.01–10% by weight, based on starting material II, of total metal; and

using a throughput of from 0.1 to 100 g of starting material III per g of catalyst calculated without carrier per hour.

4,560,770

PESTICIDAL COMPOSITIONS BASED ON N-PYRROLYLPHENYL-N'-BENZOYLUREA COMPOUNDS

Jean-Claude Gehret, Aesch, and Kurt Gubler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

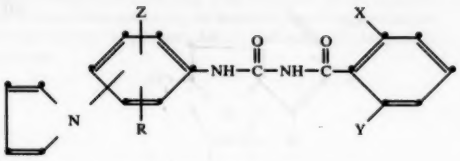
Filed Jan. 30, 1984, Ser. No. 574,798

Claims priority, application Switzerland, Feb. 9, 1983, 726/83

Int. Cl.[4] C07D *207/04;* C08K *5/21*

U.S. Cl. 548—561 8 Claims

1. A compound of the formula



in which

X and Y independently of one another are each hydrogen or halogen,

R is hydrogen or halogen, and

Z is hydrogen, halogen or methyl.

4. A process for controlling insects and members of the order Acarina in all stages of development, which process comprises applying a compound according to claim 1 to said insects or members of the order Acarina and/or to the locus thereof.

4,560,771

PROCESS FOR THE PREPARATION OF 1,2-BENZOXATHIINES

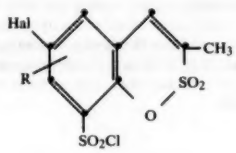
Werner Föry, Basel, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,192

Int. Cl.[4] C07D *327/06*

U.S. Cl. 549—15 8 Claims

1. A process for the preparation of a 1,2-benzoxathiine derivative of the formula I



(I)

wherein

Hal is chlorine, bromine or iodine,

R is hydrogen, halogen, nitro, C_1–C_4alkyl, C_1–C_4haloalkyl, cyano or a —X—R^1, —CO—X—R^2, —CO—NR^3R^4, —SO—R^5 or —SO_2—R^6 group, where

R^1 is C_3–C_5alkynyl, or is C_1–C_4alkyl, unsubstituted or substituted by halogen or C_1–C_4alkoxy, or is C_3–C_5alkenyl, unsubstituted or substituted by halogen or C_1–C_4alkoxy,

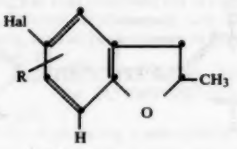
R^2 and R^5 are each independently of the other C_1–C_4alkyl, C_1–C_4haloalkyl, C_2–C_4alkoxyalkyl, C_3–C_5alkynyl, phenyl or benzyl,

R^3 and R^4 are each independently of the other hydrogen, C_1–C_4-alkyl, C_1–C_4haloalkyl, C_2–C_4alkoxyalkyl, C_3–C_5alkenyl, C_3–C_5alkynyl, phenyl or benzyl, R^6 is C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy or —NR^7R^8,

R^7 and R^8 are each independently of the other hydrogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_2–C_4alkoxyalkyl, C_3–C_5alkenyl, C_3–C_5alkynyl, phenyl or benzyl, and

X is oxygen or sulfur,

which process comprises treating a dihydrobenzofuran derivative of formula II



(II)

with chlorosulfonic acid of the formula $ClSO_3H$.

4,560,772

PREPARATION OF SUBSTITUTED PHTHALIC ANHYDRIDES

Jeffrey E. Telschow, Tarrytown, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 22, 1984, Ser. No. 663,299
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—240 **31 Claims**

1. A process for preparing a substituted phthalic anhydride which comprises reacting the Diels-Alder addition product of a conjugated diene and maleic anhydride with sulfur in the presence of zinc oxide and 2-mercaptobenzothiazole as a catalyst.

31. The process for preparing 4-methylphthalic anhydride which comprises:

(a) reacting isoprene and maleic anhydride to form 4-methyl-1,2,3,6-tetrahydrophthalic anhydride;

(b) reacting the 4-methyl-1,2,3,6-tetrahydrophthalic anhydride with sulfur in the presence of a catalyst comprising zinc oxide and 2-mercaptobenzothiazole at elevated temperatures ranging from about 190° C. to about 220° C. to form 4-methylphthalic anhydride and a thio derivative;

(c) further reacting the thio derivative with water at elevated temperatures ranging from about 150° C. to about 180° C. in the presence of a base in catalytic amounts, such base being selected from the group consisting of sodium hydroxide and N,N,N',N'-tetramethylguanidine, and in the presence of o-dichlorobenzene to form 4-methylphthalic anhydride.

4,560,773

PROCESS FOR PREPARING SUBSTITUTED PHTHALIC ANHYDRIDES

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 16, 1984, Ser. No. 600,247
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—240 **19 Claims**

1. A process for preparing a substituted phthalic anhydride which comprises reacting the Diels-Alder addition product of a conjugated diene and maleic anhydride with bromine in the presence of a catalytic amount of an acid acceptor.

10. A process for preparing a substituted phthalic anhydride which comprises:

(a) reacting a conjugated diene and maleic anhydride to form a Diels-Alder addition product;

(b) reacting the addition product with bromine in the presence of a catalytic amount of an acid acceptor.

4,560,774

MACROCYCLIC LACTONES

George R. Pettit, Paradise Valley, and Cherry L. Herald, Tempe, both of Ariz., assignors to Arizona State University, Tempe, Ariz.

Continuation-in-part of Ser. No. 442,487, Nov. 17, 1982, abandoned. This application Jul. 12, 1983, Ser. No. 513,148
Int. Cl.[4] C07D *493/22*
U.S. Cl. 549—267 **3 Claims**

1. A compound designated bryostatin 1 which has the following characteristics:

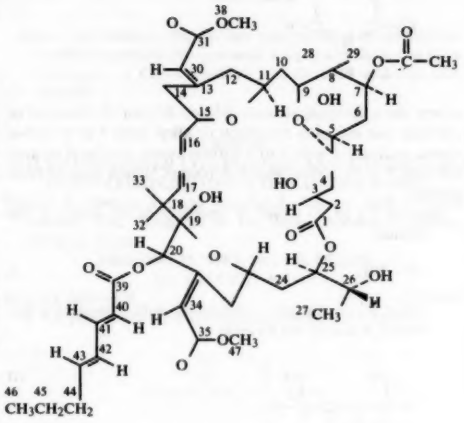
Melting Point: 230°–235°;

Optical Rotation: $[\alpha]_{D25°}+34.1°$ (C, 0.044, CH_3OH);

Ultra Violet Absorption Spectrum: (CH_3OH) λ max 233 (ε 25,700) and 263 nm (ε 28,700);

Infrared Absorption Spectrum (KBr): 3470, 3400, 2970, 2950, 1735, 1716, 1700, 1640, 1600, 1433, 1385, 1245, 1160, 1100, 1080, and 1000 cm^{-1};

and which can be shown by the following structural formula:



4,560,775

PRODUCTION OF LACTONE IN MOLTEN SALT ELECTROLYSIS

James P. Coleman; Richard C. Hallcher, both of Maryland Heights; Dudley E. McMackins, St. Charles; Charles R. Penquite, Ballwin, all of Mo., and Steven R. Auvil, Macungie, Pa., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 13, 1983, Ser. No. 503,980
Int. Cl.[4] C07D *307/32*; C07C *67/05*
U.S. Cl. 549—326 **27 Claims**

1. The process of preparing γ-vinyl-γ-butyrolactone which comprises reacting butadiene and acetic acid in the presence of a metal salt oxidant in a molten salt medium containing salts having melt properties to make the medium liquid under reaction conditions with manganese salts employed as oxidant comprising about 10% to 50% of the salts and acetic acid comprising about 20% to about 50% by weight of the molten salt medium at temperatures in the range of 130° C. to 180° C.

4,560,776

PRINS REACTION PRODUCTS OF DIISOAMYLENE, DERIVATIVES THEREOF, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING SAME

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

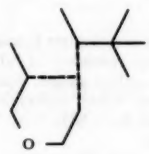
Division of Ser. No. 492,011, May 5, 1983, Pat. No. 4,495,359, which is a division of Ser. No. 391,583, Jun. 24, 1982, Pat. No. 4,429,156, which is a division of Ser. No. 267,850, May 28, 1981, Pat. No. 4,359,412. This application Jan. 12, 1984, Ser. No. 570,251

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.[4] C07D *309/18*

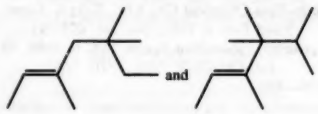
U.S. Cl. 549—356 1 Claim

1. A mixture of pyrones defined according to the generic structure:

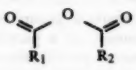


wherein in the mixture in each of the molecules one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond, produced according to the process comprising the step of intimately admixing one or a mixture of diisoamylene derivatives defined according to the genus:

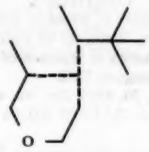
wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond or a compound having a structure selected from the group consisting of



with formaldehyde or a formaldehyde precursor selected from the group consisting of trioxane, paraformaldehyde and formalin, the reaction being carried out in the presence of a protonic acid catalyst selected from the group consisting of sulfuric acid, phosphoric acid, partoluene sulphonic acid and methane sulphone acid, the reaction being carried out using a mole ratio of effective formaldehyde:diisoamylene derivative of from 2:1 up to 1:2, the concentration of protonic acid in the reaction mass varying from about 0.01 moles per liter up to about 1 mole per liter; the reaction being carried out in the presence of an acyl anhydride having the structure:



wherein R_1 and R_2 are the same or different and each represents C_1–C_3 alkyl; the mole ratio of acyl anhydride:diisoamylene derivative varying from about 1:4 up to about 1:1; the reaction temperature varying from about 50° C. up to about 120° C.; and then recovering by means of fractional distillation, the said mixture of pyrones defined according to the generic structure:



4,560,777

PREPARATION OF ESTERS OF 2-(6'-METHOXY-2'-NAPHTHYL)-PROPIONIC ACID VIA REARRANGEMENT OF KETALS OF 2-HALO-1-(6'-METHOXY-2'-NAPHTHYL)-PROPAN-1-ONE

Claudio Giordano, Monza; Aldo Belli, Novara; Fulvio Uggeri, Codogno, and Giovanni Villa, Monticello Brianza, all of Italy, assignors to Blaschim S.p.A., Milan, Italy

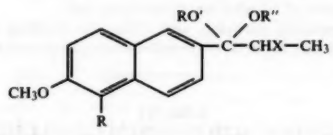
Division of Ser. No. 236,513, Feb. 20, 1981, Pat. No. 4,414,405. This application Aug. 4, 1983, Ser. No. 520,190

Claims priority, application Italy, Feb. 26, 1980, 20187 A/80

Int. Cl.[4] C07D *319/06, 317/00*

U.S. Cl. 549—374 7 Claims

1. A compound having the formula:



wherein

R is selected from the group consisting of a hydrogen and a bromine atom;

R' and R'', together, are an alkylene radical having from 2 to 6 carbon atoms which, together with the group

forms a heterocyclic ring selected from the group consisting of a 1,3-dioxolane ring and a 1,3-dioxane ring;

X is a halogen atom.

4,560,778

OLIGOMERS OF PERFLUORO(2,2-DIMETHYL-1,3-DIOXOLE) AND THEIR FLUORINATION PRODUCTS

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 421,825, Sep. 23, 1982, Pat. No. 4,496,749, which is a division of Ser. No. 279,867, Jul. 2, 1981, Pat. No. 4,409,393. This application Sep. 14, 1984, Ser. No. 650,865

Int. Cl.[4] C07D *317/00*

U.S. Cl. 549—455 6 Claims

1. A method of oligomerizing perfluoro(2,2-dimethyl-1,3-dioxole), said method consisting in maintaining perfluoro(2,2-dimethyl-1,3-dioxole) in contact with an organic ether selected from the class consisting of liquid aliphatic and cycloaliphatic, monomeric and polymeric ethers for a sufficient period to

cause formation of a liquid or waxy, noncrystalline oligomer incapable of being pressed into a self-supporting film.

4,560,779

PREPARATION AND POLYMERIZATION OF OXETHER-1

John M. Guimont; Gerald E. Manser, both of Cupertino, and Donald L. Ross, Los Altos, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1982, Ser. No. 400,179
Int. Cl.⁴ C07D *305/06*
U.S. Cl. 549—510 **1 Claim**

1. As a new compound, the monomer 3-methyl-3-(2,2-dinitropropoxymethyl)oxetane.

4,560,780

METHOD FOR PREPARING PALLADIUM(II)HEXAFLUOROACETYLACETONATE)

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 509,956, Jun. 30, 1983, Pat. No. 4,500,569, which is a division of Ser. No. 351,505, Feb. 23, 1982, Pat. No. 4,410,569, which is a division of Ser. No. 159,367, Jun. 13, 1980, Pat. No. 4,424,352. This application Nov. 13, 1984, Ser. No. 671,102
Int. Cl.⁴ C07F *15/00*
U.S. Cl. 556—40 **4 Claims**

1. A method for preparing crystalline palladium (II)bis(hexafluoroacetylacetonate) which method comprises the steps of:

(a) reacting a palladium(II) salt with an aqueous alkaline solution of hexafluoroacetylacetone, and

(b) separating, purifying, and drying the resulting precipitated palladium(II) bis(hexafluoroacetylacetonate).

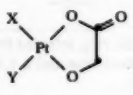
4,560,781

GLYCOLIC ACID PLATINUM COMPLEXES

Tetsushi Totani, Hyogo; Katsutoshi Aono, Nara, and Michihiro Komura, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Nov. 17, 1983, Ser. No. 552,906
Claims priority, application Japan, Dec. 21, 1982, 57-225272
Int. Cl.⁴ C07F *15/00*
U.S. Cl. 556—137 **7 Claims**

1. A compound of the general formula:



[wherein X and Y each is straight or branched chain alkylamine, or X and Y taken together form ethylenediamine, 1,2-diaminocyclohexane, exo-cis-2,3-diaminobicyclo[2.2.1]heptane, or 1,2-diaminoadamantane].

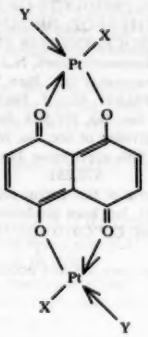
4,560,782

ANTI-TUMOR DIPLATINUM COORDINATION COMPOUNDS

Vassilios P. Papageorgiou; Maria Bakola-Christianopoulou, and Constantinos A. Tsipis, all of Thessaloniki, Greece, assignors to Research Corporation, New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,107
Claims priority, application Greece, Nov. 19, 1982, 71039
Int. Cl.⁴ C07F *15/00*
U.S. Cl. 556—137 **8 Claims**

1. A diplatinum complex having the general formula:



wherein X and Y are monodentate ligands independently selected from the group consisting of NH_3, Cl, lower alkyl amines, aryl amines, aralkyl amines, hydroxy lower alkylamines, hydroxylamine, lower alkoxyamines, alkoxyalkylamines, aminoacids, OH, Br, I, NO_2, NO_3, CN, SCN, monocarboxylates and the like.

4,560,783

PROCESS FOR PRODUCING ALUMINUM CITRATE SOLUTIONS

Tod K. Shioyama, and Robert A. Little, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 21, 1983, Ser. No. 544,185
Int. Cl.⁴ C07F *5/06*
U.S. Cl. 556—183 **13 Claims**

1. A process for preparing a stable aqueous solution of aluminum citrate comprising adding citric acid or sodium aluminate under an atmosphere substantially free of carbon dioxide under suitable reaction conditions below 40° C. followed by neutralization.

4,560,784

HEAT-RESISTANT ORGANOPOLYSILOXANE COMPOSITION

Shigeru Mori, and Yasuo Tarumi, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,793
Claims priority, application Japan, Feb. 6, 1984, 59-19773
Int. Cl.⁴ C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—401 **5 Claims**

1. A heat-resistant organopolysiloxane composition which comprises:

(A) 100 parts by weight of a first organopolysiloxane; and

(B) from 0.1 to 10 parts by weight of a reaction product obtained by subjecting a mixture comprising

(a) 100 parts by weight of a second organopolysiloxane having a viscosity in the range from 10 to 10,000 centistokes at 25° C.,

(b) a cerium carboxylate represented by the general formula $(R^1COO)_nCe$, in which R^1 is a monovalent hydrocarbon group and the suffix n is 3 or 4, in such an amount that from 0.5 to 5 parts by weight of cerium are provided, and

(c) an alkoxide compound of titanium or zirconium represented by the general formula $(R^2O)_4M$, in which R^2 is a monovalent hydrocarbon group and M is an atom of titanium or zirconium, or a partial hydrolysis product thereof in an amount to provide the element of titanium or zirconium in an amount in the range from 0.1 to 5 times by weight of the amount of cerium in the component (b),

to a heat treatment at a temperature of 150° C. or higher.

4,560,785

PHENYLACETIC ESTER DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Haruyoshi Honda, Tomisatomura; Susumu Sato, Chiba; Kazuo Isomae, Narashino; Junji Ookawa, Yokaichiba, and Tsukasa Kuwamura, Yachiyo, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

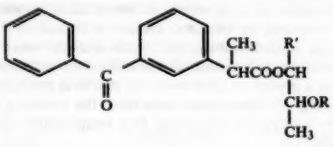
Filed Feb. 21, 1984, Ser. No. 581,990

Claims priority, application Japan, Mar. 2, 1983, 58-34194; Mar. 4, 1983, 58-35472

Int. Cl.[4] C07C *69/76*

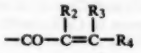
U.S. Cl. 560—52 **13 Claims**

1. A phenylacetic ester derivative of formula (I):



(I)

wherein R is hydrogen; a COR_1 group, wherein R_1 is alkyl or alkenyl; a



group, wherein R_2 is hydrogen, halogen, cyano, lower alkyl or phenyl, R_3 is hydrogen, lower alkyl or phenyl, R_4 is phenyl or phenyl substituted by lower alkyl, lower alkyloxy, acyloxy, hydroxy or halogen; or —CO—A—R_5, wherein A is a single bond, C_1–C_2 alkylene or C_1–C_2 alkyleneoxy, and R_5 is phenyl or phenyl substituted by lower alkyl, lower alkyloxy, acyloxy, hydroxy, halogen, nitro, benzoyl or alkylenedioxy; and R' is hydrogen or methyl.

4,560,786

$\Delta^{8,9}$-PROSTAGLANDIN DERIVATIVES, THEIR PREPARATION AND USE AS MEDICINAL AGENTS

Werner Skuballa; Bernd Raduechel; Norbert Schwarz; Helmut Vorbrueggen; Walter Elger; Olaf Loge, and Michael-Harold Town, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

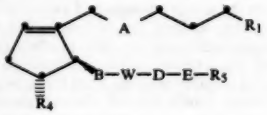
Filed Jun. 24, 1982, Ser. No. 391,734

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3125271

Int. Cl.[4] C07C *177/00*

U.S. Cl. 560—55 **46 Claims**

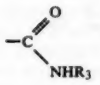
1. A $\Delta^{8,9}$-prostane derivative of the formula



wherein

R_1 is CH_2OH or

wherein R_2 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; C_{1-4} alkoxy; C_{6-10}-aryl or aroyl; C_{6-10}-aryl or aroyl each substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5-6 ring atoms, one or two of which is O, N or S, the remainder being carbon atoms; or R_1 is

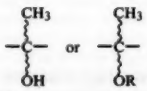


wherein R_3 is an acyl group of of a hydrocarbon C_{1-15} carboxylic or sulfonic acid or is one of the R_2 groups;

A is $—CH_2—CH_2—$ or cis—CH=CH—;

B is $—CH_2—CH_2—$, trans—CH=CH— or —C≡C—;

W is hydroxymethylene, RO—methylene,



wherein all OH— or OR— groups are in the α- or β-position,

R is tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;

D and E jointly are a direct bond or

D is straight-chain or branched alkylene or alkenylene of 1–10 carbon atoms, optionally substituted by 1-2 fluorine atoms and E is oxygen, sulfur, a direct bond, —C≡C—, or $—CR_6=CR_7—$, wherein R_6 and R_7 differ from each other and each is hydrogen, chlorine or C_{1-6}-alkyl;

R_4 is OH or OR;

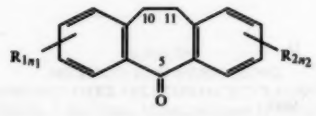
R_5 is (a) a C_{1-10} hydrocarbon aliphatic radical, (b) a C_{1-10} hydrocarbon aliphatic radical substituted by C_{6-10}-aryl or -aroyl or by C_{6-10}-aryl or -aroyl each substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{4-10} cycloalkyl, (d) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; or (h) an aromatic heterocycle of 5 or 6 ring atoms one or two of which is O, N or S, the remainder being carbon atoms; or when R_2 is hydrogen, a physiologically compatible salt thereof with a base with the proviso that D-E-R_5 is not n-pentyl, when W is —CHOR—, B is trans—CH=CH—, R_4 is OR, A is cis—CH=CH—, R_1 is $—COOCH_3$, and R is H or tetrahydropyranyl.

4,560,787
PROCESS FOR PREPARING 10,11-DIHYDRO-5H-DIBENZO[A,D]CYCLOHEPTENE-5-ONE COMPOUNDS

Günter Zoche, Bonn, and Wilhelm Vogt, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 422,785, Sep. 24, 1982, abandoned. This application Jul. 19, 1984, Ser. No. 632,672
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138842; Oct. 31, 1981, 3143307
Int. Cl.[4] C07C *45/45*
U.S. Cl. 560—52 11 Claims

1. A process for preparing 10,11-dihydro-5H-dibenzo[a,d]-cyclopheptene-5-one compounds of the formula



wherein one or more of the hydrogen can be replaced by one of R_1 and R_2, R_1 and R_2 being selected from halogen, alkyl, alkoxy, aryl, aralkyl, and carboalkoxy; and n_1 and n_2 are integers from 0–4; which process comprises cyclocondensation of the corresponding dibenzyl-o-carboxylic acid at temperatures from 50° C. to 180° C. in the presence of aromatic compounds containing one or more trichloromethyl groups on the aromatic ring and in the presence of a catalytic amount of 0.01 to 10 weight percent, based on corresponding dibenzyl-o carboxylic acid, of a Lewis acid.

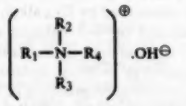
4,560,788
PROCESS FOR PRODUCING OLIGOESTERS

Akira Miyamoto; Senzo Shimizu; Masayoshi Okamura; Hiroka Tanisake; Yasumitsu Higuchi; Toshio Hidaka; Koji Yamamoto, and Toshiyuki Abe, all of Kanagawa, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 323,500, Nov. 20, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,763
Claims priority, application Japan, Nov. 22, 1980, 55-165158
Int. Cl.[4] C07C *67/26*
U.S. Cl. 560—91 2 Claims

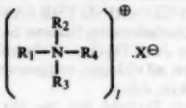
1. A process for producing an oligoester consisting of:

(a) reacting isophthalic acid with propylene oxide, in a molar ratio of 1.1–3.3 moles of propylene oxide per mole of isophthalic acid, in a reaction medium in the presence of catalyst, the reaction medium being a reaction product of isophthalic acid with propylene oxide, propylene glycol, or a mixture thereof, and wherein the catalyst is selected from the group consisting of compounds represented by formula (I):



(I)

wherein R_1, R_2, R_3 and R_4 may be the same or different and are independently an alkyl group having 1 to 4 carbon atoms or a hydroxy-substituted alkyl group having 1 to 4 carbon atoms; compounds represented by the formula (II):



(II)

wherein R_1, R_2, R_3 and R_4 may be the same or different and are independently an alkyl group having 1 to 4 carbon atoms or a hydroxy-substituted alkyl group having 1 to 4 carbon atoms, l is 1 or 2, and X is selected from the group consisting of halo, a carbonic acid or bicarbonic acid anion, an anion of an aliphatic mono- or di-carboxylic acid, an anion of an aromatic mono- or dicarboxylic acid, or an anion of an aromatic mono- or dicarboxylic acid which is nuclear-substituted with one or more alkyl groups having 1–2 carbon atoms; and mixtures thereof and

(b) adding a glycol or glycols to the reaction product (a);

(c) removing volatile components from the resulting oligoester by heating the oligoester to a temperature of about 180°–280° C.

4,560,789
PROCESS FOR PRODUCING 4-ACETOXYACETANILIDE

Kenneth G. Davenport, and Charles B. Hilton, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 3, 1984, Ser. No. 627,381
Int. Cl.[4] C07C *103/46, 103/38*
U.S. Cl. 560—142 7 Claims

1. A process comprising contacting phenyl acetate or phenol and an acetylating agent with a Fries - Friedel-Crafts reaction catalyst to form 4-hydroxyacetophenone, contacting the latter with hydroxylamine or a hydroxylamine salt and a base to form 4-hydroxyacetophenone oxime, and contacting said oxime with a Beckmann rearrangement catalyst and acetic anhydride to form 4-acetoxyacetanilide.

4,560,790
PROCESS FOR SYNTHESIZING α,β-ETHYLENICALLY UNSATURATED PRODUCTS USING A MULTICOMPONENT ACIDIC CATALYST COMPOSITION

Ji-yong Ryu, Ramsey, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 448,697, Dec. 10, 1982, Pat. No. 4,430,252. This application Aug. 8, 1983, Ser. No. 520,909
Int. Cl.[4] C07C *67/343, 51/353, 45/74*
U.S. Cl. 560—210 25 Claims

1. A process for the vapor phase condensation, of reactants comprising (a') at least one member selected from the group consisting of aldehyde, acetal, and hemiacetal with at least one member selected from the group consisting of carboxylic acid and carboxylic acid ester, to form the corresponding alpha, beta-ethylenically unsaturated acid or ester product respectively; or (b') at least one terminal carbonyl containing compound with at least one member selected from the group consisting of aldehyde, acetal, hemiacetal and mixtures thereof, to form the corresponding alpha, beta-ethylenically unsaturated product; in the presence of a catalyst composition, which comprises:

A. providing a catalyst composition prepared in accordance with the process comprising:

(1) reacting in admixture at least one Metal Hydrocarboxide I, at least one Metal Hydrocarboxide II, at least one acidic phosporus-oxygen containing compound, and water in the presence of at least one liquid organic medium comprising at least 50% by weight, based on the weight of said medium, of at least one member selected from the group consisting of organic aldehyde, organic ketone, and organic ether, said reaction being conducted in a manner

sufficient to (a) avoid contact of Metal Hydrocarboxides I and II with water prior to contact of Metal Hydrocarboxides I and II with the acidic phosphorus-oxygen containing compound, and (b) form a catalyst precursor composition;

(2) separating said catalyst precursor composition from said reaction admixture;

(3) calcining said catalyst precursor composition to form said catalyst composition; wherein said process:

(i) the metal M^1, of said Metal Hydrocarboxide I is selected from at least one member of the group consisting of Al, Ga, In, and Tl; and

(ii) the metal M^2, of said Metal Hydrocarboxide II is selected from at least one member of the group consisting of Si, Sn, and Ge; and

B. contacting the catalyst composition prepared in accordance with step A with reactants (a') or (b') in a manner and under conditions sufficient to form the said corresponding products.

4,560,791

SYNTHESIS OF TRICONJUGATED DIENONES AND INTERMEDIATES USED IN SAID PROCESS

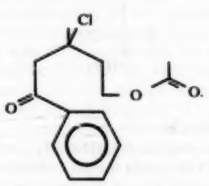
William J. Evers, Locust; Gilbert Stork, Englewood; Braja D. Mookherjee, Holmdel, and Howard H. Heinsohn, Jr., Freehold, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 431,268, Sep. 30, 1982, Pat. No. 4,451,392. This application Nov. 14, 1983, Ser. No. 551,480

Int. Cl.⁴ C07C *69/157*

U.S. Cl. 560—254 **1 Claim**

1. The compound having the structure:



4,560,792

DISPROPORTIONATION OF FUNCTIONAL OLEFINS

Dennis S. Banasiak, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

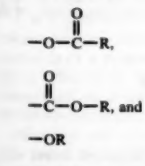
Filed Jul. 20, 1982, Ser. No. 400,188

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.⁴ C07C *67/08, 67/333, 41/32*; C11C *3/02*

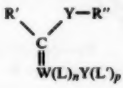
U.S. Cl. 560—261 **19 Claims**

1. A method for preparing a trans-rich internally unsaturated olefin having an oxygen-containing functional group comprising reacting (1) a symmetrical difunctional monoolefin in which the functional groups are terminal functional groups selected from the groups having the formulas



wherein R is a hydrocarbyl group having 1 to 20 carbon atoms or in the case of the first formula hydrogen with (2) a hydrocarbyl monoolefin consisting essentially of either an internal olefin or an alpha-olefin having at least three carbon atoms per molecule under suitable reaction conditions in the presence of a catalytic amount of a catalyst composition comprising effective amounts of

(1) at least one neutral carbene complex having the formula



wherein R' is selected from the group consisting of alkyl or cycloalkyl radicals containing 1 to 10 carbons per radical and aryl or substituted aryl radicals containing 6 to 30 carbon atoms per radical wherein the substituted radicals can have one or more substituents, each of which can be the same or different and selected from the group consisting of halides, alkoxides, and alkyl radicals containing 1 to 20 carbon atoms per radical; wherein Y is S or O; R'' is selected from the group consisting of alkyl, cycloalkyl, aryl, and substituted aryl radicals containing 1 to 30 carbon atoms per molecule and wherein the aryl substituents are as described for R' and wherein if Y is S only one of R' and R'' can be aryl or substituted aryl; each L is a neutral ligand individually selected from CO, NO, PR'_3, PCl_3, PF_3, and pyridine, where R' is as defined above, and L' is cyclopentadienyl; p is 0 or 1; and n is 5 when p is 0 or 2 when p is 1; and

(2) a metal component selected from the group consisting of the chlorides and bromides of the metals of Groups IVa, IVb, Vb, VIb, VIIb, VIII, and Ib and the oxychlorides and oxybromides of molybdenum, tungsten, vanadium, and chromium, wherein if the metal is vanadium it is in an oxidation state of either 4 or its highest, stable, common, ionic oxidation state; if the metal is molybdenum, tungsten, or rhenium it is in an oxidation state of either 5 or its highest, stable, common, ionic oxidation state; and if the metal is not vanadium, molybdenum, tungsten or rhenium the metal is in its highest, stable, common, ionic, oxidation state, characterized by the fact that the symmetrical difunctional olefin is substantially all in the trans form.

4,560,793

PROCESS FOR PRODUCING TEREPHTHALIC ACID

Hiroshi Hashizume, and Yoshiaki Izumisawa, both of Kitakyusyu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 860,479, Dec. 14, 1977, abandoned. This application Sep. 29, 1981, Ser. No. 306,762

Claims priority, application Japan, Dec. 30, 1976, 51-158987

Int. Cl.⁴ C07C *51/16*

U.S. Cl. 562—414 **9 Claims**

1. In a process for the continuous production of terephthalic acid by oxidizing p-xylene with molecular oxygen in acetic acid as a solvent in the presence of a catalyst system containing cobalt, manganese and bromine, the improvement comprising:

recovering substantially all of the methylacetate present in the vapor evolved from the oxidation reactor; and

recirculating said recovered methylacetate to the reactor.

4,560,794

PROCESS FOR PREPARING METHOXYTRIFLUOROMETHYLNAPHTHOIC ACID FROM METHYLNAPHTHOIC ACID

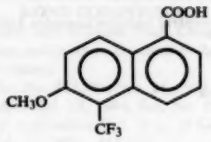
Arthur M. Foster, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,184

Int. Cl.⁴ C07C *63/34*

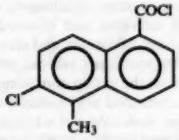
U.S. Cl. 562—467 **20 Claims**

1. A process for preparing a methoxytrifluoromethylnaphthoic acid compound of formula

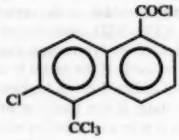


comprising the steps of

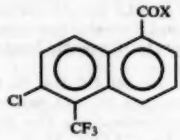
(a) converting 1-methyl-5-naphthoic acid into a chloromethylnaphthoyl chloride compound of formula



(b) photochlorinating the chloromethylnaphthoyl chloride of step (a) in the liquid phase to prepare a chlorotrichloromethylnaphthoyl chloride of formula

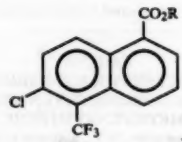


(c) fluorinating the chlorotrichlormethylnaphthoyl chloride of step (b) in the liquid phase in the presence of a halogen transfer catalyst to prepare a chlorotrifluoromethylnaphthoyl halide of formula



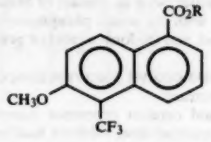
where X is chlorine or fluorine,

(d) esterifying the chlorotrifluoromethylnaphthoyl halide of step (c) by reaction with a lower alkanol to prepare a chlorotrifluoromethylnaphthalate of formula



where R is methyl, ethyl, propyl or butyl,

(e) methoxylating the chlorotrifluoromethylnaphthalate of step (d) by reaction with sodium methoxide in the presence of a cuprous halide to prepare a methoxytrifluoromethylnaphthalate of formula



where R is defined in step (d), and

(f) hydrolyzing the methoxytrifluoromethylnaphthalate of step (e).

4,560,795

α-HALOMETHYL DERIVATIVES OF α-AMINO ACIDS

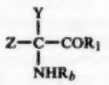
Philippe Bey, Strasbourg, and Michel Jung, Illkirch-Graffenstaden, both of France, assignors to Merrell Dow France et Cie, Strasbourg, France

Division of Ser. No. 392,051, Jun. 25, 1982, Pat. No. 4,438,270, which is a continuation of Ser. No. 53,937, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Feb. 6, 1984, Ser. No. 577,116

Int. Cl.⁴ C07C *101/24*

U.S. Cl. 562—561 **8 Claims**

1. A compound of the formula:



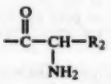
wherein

Y is F_2CH or Cl_2CH;

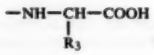
Z is γ-guanidinopropyl or $R_aHN(CH_2)_n$;

n is the integer 3 or 4 with the proviso that when n is 3 and Y is F_2CH—, then R_a and R_b cannot be hydrogen and R_1 cannot be hydroxy;

each of R_a and R_b is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or the group



wherein R_2 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $—NR_4R_5$ wherein each R_4 and R_5 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms, or the group



wherein R_3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl, with the proviso that when Z is γ-guanidinopropyl, R_1 is hydroxy; and the pharmaceutically acceptable salts and individual optical isomers thereof.

4,560,796

PROCESS FOR THE MODIFICATION OF THE CRYSTAL FORM OF DICYANDIAMIDE

Gerhard Smutek, Tacherting, and Hermann Raveling, Altenmarkt, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,673

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241070

Int. Cl.[4] C07C *129/14*

U.S. Cl. 564—104 11 Claims

1. A process for the moification of the crystal form of dicyandiamide, comprising crystallizing the dicyandiamide from aqueous solution, in the presence of 0.001 to 10% by weight of polyvinyl alcohol, a water-soluble cellulose ether derivative, guar or a combination thereof, based on the weight of dicyandiamide, by cooling the aqueous solution.

4,560,797

OXIDATION OF PRIMARY AMINES TO OXIMES BY ELEMENTAL OXYGEN WITH CATALYST REGENERATION

Jean Yamanis, Morris Township, Morris County; Emery J. Carlson, Chatham, and John N. Armor, Hanover Township, Morris County, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 20, 1982, Ser. No. 451,701

Int. Cl.[4] C07C *131/04, 131/00;* B01J *23/92*

U.S. Cl. 564—267 4 Claims

1. In a process for production of oximes by selective oxidation, in the vapor phase, of saturated primary aliphatic or alicyclic amines having 2 to 12 carbon atoms with elemental oxygen, in a reaction zone, in the presence of an effective amount of a catalyst comprising an oxygen-containing tungsten compound and alumina, wherein the initial steady state value of the percent conversion, the initial steady state value of the rate of formation of oxime and the initial steady state value of the percent selectivity for formation of oxime decrease with time, the improvement which comprises periodically regenerating said catalyst by heating said catalyst in said reaction zone at a temperature in the range of about 250° C. to about 300° C. in the presence of elemental oxygen for a time sufficient to produce a catalyst comprising an oxygen-containing tungsten compound and alumina that gives rise to a new steady state value of the percent conversion, a new steady state value of the rate of formation of oxime, and a new steady state value of the selectivity for formation of oxime at least equivalent to the initial steady state values.

4,560,798

PRODUCTION OF AMINOETHYLETHANOLAMINE USING RARE EARTH METAL OR STRONTIUM HYDROGEN PHOSPHATES AS CATALYSTS

Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1984, Ser. No. 664,815

Int. Cl.[4] C07C *91/04*

U.S. Cl. 564—503 4 Claims

1. In a process for the synthesis of an organic amine by the intermolecular condensation of a hydroxy composition with ammonia or a primary or secondary amine said condensation being effected in the presence of a phosphorus-containing compound as a catalyst, the improvement for producing aminoethylethanolamine in high selectivity which comprises:

effecting self condensation of monoethanolamine in the presence of a catalyst comprising a rare earth metal acid phosphate selected from the group consisting of scandium, yttrium, lanthanum and the rare earth lanthanides having an Atomic Number from 58 to 71 at a pressure from 50 to 400 psig and a temperature from 175° to 275° C.

4,560,799

TRI- AND TETRA-(SUBSTITUTED HYDROXYPHENYLTHIO) ALKANE AND CYCLOALKANE STABILIZERS AND STABILIZED COMPOSITIONS

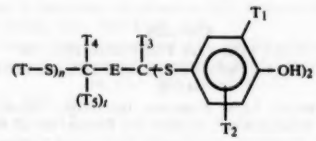
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1984, Ser. No. 576,978

Int. Cl.[4] C07D *149/00*

U.S. Cl. 568—47 14 Claims

1. A compound of formula I



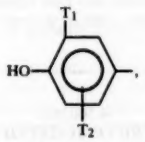
(I)

wherein

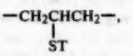
T_1 and T_2 are independently alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, phenylalkyl of 7 to 9 carbon atoms or said phenylalkyl substituted by alkyl of 1 to 12 carbon atoms,

T_2 may also be hydrogen,

T is alkyl of 1 to 24 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, or the group



E is a direct bond, alkylene of 1 to 11 carbon atoms, cycloalkylene of 5 to 6 carbon atoms or phenylene, or is the group



T_3 and T_4 are independently hydrogen, alkyl of 1 to 30 carbon atoms, said alkyl substituted by phenyl or by phenyl substituted by alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, or

T_3 and T_4 together are straight- or branched-chain alkylene of 3 to 7 carbon atoms when E is methylene,

T_5 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,

n is 1 or 2, t is 0 or 1, and t is 2-n.

4,560,800

ISOLATION OF M,M'-DINITROBENZOPHENONE

Kiran R. Bakshi, Murrysville; Adrian D'Souza, Pittsburgh, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Sep. 17, 1984, Ser. No. 650,881

Int. Cl.[4] C07C *45/61*

U.S. Cl. 568—306 21 Claims

1. A process for preparing m,m'-dinitrobenzophenone which comprises:

reacting benzophenone with nitric acid and oleum to form a first reaction product containing m,m'-dinitrobenzophenone;

passing said first reaction product to a solvent extraction zone;

contracting said first reaction product in said solvent extrac-

tion zone with a solvent extracting amount of a chlorinated hydrocarbon having from one to six carbon atoms under solvent extraction conditions and wherein the water content in said solvent extraction zone is from about 12 to about 30 weight percent based on the weight of solvent-free material in said extraction zone;

separating said chlorinated hydrocarbon from said first reaction product; and

recovering m,m'-dinitrobenzophenone from said separated chlorinated hydrocarbon.

4,560,801

PROCESS FOR THE PREPARATION OF 4-HYDROXY-2,4,6-TRIMETHYL-2,5-CYCLOHEXADIENONE

Michel Costantini, Lyon; Francoise Igersheim, Villeurbanne, and Léon Krumenacker, Serezin Du Rhone, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jul. 10, 1984, Ser. No. 629,423

Claims priority, application France, Jul. 13, 1983, 83 11708

Int. Cl.[4] C07C *45/30*

U.S. Cl. 568—362 **4 Claims**

1. Process for the preparation of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadienone which comprises reacting 2,4,6-trimethylphenol with chlorine in an inert organic solvent selected from the class consisting of aliphatic and cycloaliphatic hydrocarbons which may be halogenated, aliphatic carboxylic acid esters and ethers, in the presence of an alkali metal hydroxide, bicarbonate or carbonate, and then hydrolysing the chlorination product with water, with or without an inorganic base, at a pH of 0 to 10.

4,560,802

SYNTHESIS OF TRICONJUGATED DIENONES AND NOVEL INTERMEDIATES USED IN SAID PROCESS

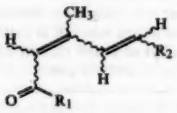
William J. Evers, Locust; Gilbert Stork, Englewood; Braja D. Mookherjee, Holmdel, and Howard H. Heinsohn, Jr., Freehold, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 551,480, Nov. 14, 1983, which is a division of Ser. No. 431,268, Sep. 30, 1982, Pat. No. 4,451,392. This application Jun. 13, 1984, Ser. No. 620,086

Int. Cl.[4] C07C *45/65*

U.S. Cl. 568—388 **2 Claims**

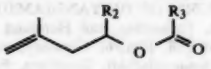
1. A process for preparing a triconjugated dienone defined according to the structure:



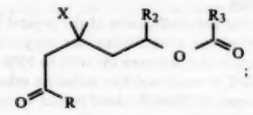
wherein R_1 is C_1–C_8 alkyl, phenyl or phenyl methyl and R_2 is hydrogen or C_1–C_5 alkyl; and wherein the wavy lines represent the "cis" and "trans" juxtaposition of the vinyl, methyl, acyl and R_2 moieties about one or both of the carbon-carbon double bonds comprising the steps of:

(i) reacting an acyl halide having the structure:

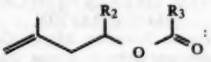
wherein X represents chloro with an ester having the structure:



in the presence of an aluminum chloride catalyst and a methylene dichloride solvent in order to form the compound having the structure:

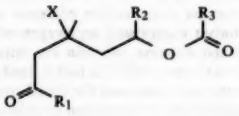


wherein R_3 is C_1–C_5 alkyl, the mole ratio of aluminum trichloride:ester defined according to the structure:

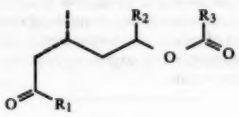


acyl halide being about 2:1:1, the reaction temperature being in the range of from about −30° C. up to about +20° C.; then

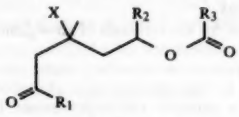
(ii) dehydrohalogenating the compound having the structure:



with a dehydrohalogenation agent comprising an alkali metal carbonate and dimethylformamide to form a compound defined according to the structure:

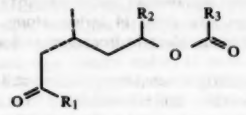


wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; and wherein X represents chloro, bromo or iodo, the temperature of reaction being between about 80° C. and 100° C., the mole ratio of alkali metal carbonate:haloester defined according to the structure:

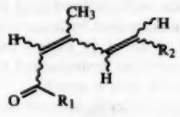


being from about 2:1 down to about 1:1; the concentration of the haloester reactant in the dimethylformamide solvent varying from about 0.1 moles per liter up to about 1.5 moles per liter; and then

(iii) dehydroacyloxylating the resulting compound having the structure:



with an alkali metal carbonate and dimethylformamide at a temperature of from about 100° C. up to about 150° C. thereby forming the compound having the structure:



4,560,803

CATALYSTS AND PROCESS FOR OXIDATION OF OLEFINS TO KETONES

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 420,626, Sep. 21, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,901

Int. Cl.⁴ C07C *45/34, 45/39*

U.S. Cl. 568—401 **11 Claims**

1. A process for preparing ketones which comprises contacting the corresponding olefin in the gaseous phase with water vapor and molecular oxygen in a reaction zone at elevated temperature in the presence of a catalyst comprising rhenium sulfide, said olefin comprising at least one member selected from the group consisting of linear mono-olefins of from 2 to 20 carbon atoms and cyclic mono-olefins of from 3 to 20 carbon atoms.

4,560,804

CATALYTIC PROCESS FOR THE MANUFACTURE OF KETONES

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 420,525, Sep. 21, 1982, abandoned, and Ser. No. 420,526, Sep. 21, 1982, abandoned, and Ser. No. 420,648, Sep. 21, 1982, abandoned, and Ser. No. 420,716, Sep. 21, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,537

Int. Cl.⁴ C07C *45/34, 45/42*

U.S. Cl. 568—408 **13 Claims**

1. A process for preparing ketones which comprises contacting the corresponding olefin in the gaseous phase with water vapor in a reaction zone at elevated temperature in the presence of a catalyst selected from the group consisting of at least one sulfide of Ce, Nd and La, said olefin comprising at least one member selected from the group consisting of linear mono-olefins of from 2 to 20 carbon atoms and cyclic mono-olefins of from 3 to 20 carbon atoms.

4,560,805

CATALYSTS AND PROCESS FOR THE CONVERSION OF OLEFINS TO KETONES

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 420,527, Sep. 21, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,902

Int. Cl.⁴ C07C *45/42*

U.S. Cl. 568—408 **10 Claims**

1. A process for preparing ketones in high selectivity which comprises contacting the corresponding olefin in the gaseous phase with water vapor in an oxygen-free reaction zone at elevated temperature in the presence of a catalyst comprising rhenium sulfide, said olefin comprising at least one member selected from the group consisting of linear mono-olefins of from 2 to 20 carbon atoms and cyclic mono-olefins of from 3 to 20 carbon atoms.

4,560,806

PROCESS AND CATALYST USEFUL IN THE PRODUCTION OF GLYCOL ALDEHYDE

Stephen E. Jacobson, Morristown, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 508,704, Jun. 28, 1983, abandoned. This application Apr. 5, 1984, Ser. No. 596,994

Int. Cl.⁴ C07C *45/49, 47/19*

U.S. Cl. 568—462 **13 Claims**

1. A process for the preparation of glycol aldehyde comprising contacting formaldehyde, carbon monoxide and hydrogen in the presence of an effective polar or, non-polar organic solvent and metal catalyst complex, under superatmospheric pressures and elevated temperatures; the metal catalyst complex having the formula:

$$MX_x(CO)_y[P(R_1)_2R_2(O)C{-}NR_3R_4]_z,$$

wherein M is a metal selected from the group of rhodium, cobalt, ruthenium and mixtures thereof;

X is an anion selected from the class of halides, pseudohalides, hydrides, and deprotonated strong carboxylic acids;

P is phosphorous;

R_1 is an aliphatic or aromatic group containing from 1–20 carbon atoms;

R_2 is an aliphatic or aromatic group containing from 0–20 carbon atoms, which group is either unsubstituted, or substituted with oxygen, nitrogen and sulfur atoms which are either directly bonded to the amide C(O)N carbon or nitrogen or, to an R_2 carbon atom; if R_2=0, then the phosphorous atom is directly bonded to the amide nitrogen;

R_3 and R_4 are aliphatic or aromatic groups containing from 1–100 carbon atoms;

x ranges from 0 to 3, y ranges from 1 to 5, and z from 1 to 4;

the resultant compound further characterized by the absence of hydrogen on the amido nitrogen atom and the additional limitation that if R_2 is bonded to the amide nitrogen, then either R_3 or R_4 is bonded to the amide carbon;

separating the product glycol aldehyde from the reaction mixture.

4,560,807

PROCESS FOR THE PRODUCTION OF DIMETHYL ETHER USEFUL AS A PROPELLANT

Nobuyuki Murai, Yokkaichi; Kazuya Nakamichi, Matsuzaka; Masayuki Otake, Yokohama, and Takashi Ushikubo, Sagamihara, all of Japan assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,943

Claims priority, application Japan, Apr. 27, 1983, 58-74710

Int. Cl.⁴ C07C *41/09*

U.S. Cl. 568—698 **9 Claims**

1. A process for producing dimethyl ether, which is useful as a propellant, by dehydrating methanol and recovering dimethyl ether from the dehydrated product by distillation, which comprises:

(a) dehydrating methanol in the vapor phase under a pressure of from 2 to 50 kg/cm² G over a solid acid catalyst;

(b) cooling the obtained reaction mixture;

(c) distilling said cooled reaction mixture in a first pressurized distillation column under a pressure of at least 5 kg/cm² G, whereby substances having a boiling point less than dimethyl ether are removed from the top of said

column, refined dimethyl ether is removed as a side stream from said column and the bottoms of said column are withdrawn;

(d) introducing said bottoms into a second distillation column;

(e) distilling said bottoms in a second distillation column under a pressure lower than the pressure in the first distillation column, whereby substances having a boiling point lower than that of methanol are removed from the top of said second distillation column, unreacted methanol is recovered as a side stream from said second distillation column and the bottoms of said second distillation column are withdrawn; and

(f) recycling said unreacted methanol to said dehydration reaction step.

4,560,808

PROCESS FOR PRODUCTION OF DIHYDRIC PHENOLS

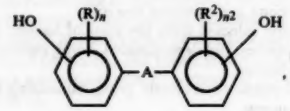
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

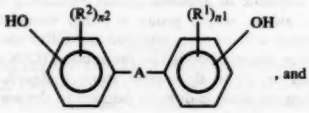
Filed Jan. 2, 1985, Ser. No. 688,377

Int. Cl.[4] C07C *39/16*

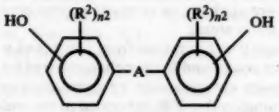
U.S. Cl. 568—722 **19 Claims**

1. A process of preparing at least one dihydric phenol represented by the formulae

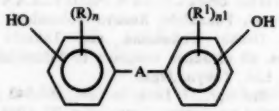




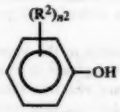
, and



comprising reacting, in the presence of a catalytic amount of a catalyst selected from a base transalkylation catalyst or an acid catalyst selected from the protic acids and Lewis acids, at least one dihydroxy aromatic compound represented by the formula



with at least one monohydroxy aromatic compound represented by the formula



wherein

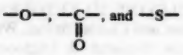
R is independently selected from halogen radicals, monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms, monovalent hydrocarbonoxy radicals containing from 1 to about 14 carbon atoms, and halogen substituted monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms,

R^1 is independently selected from halogen radicals, monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms, monovalent hydrocarbonoxy radicals containing from 1 to about 14 carbon atoms, and halogen substituted monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms,

R^2 is independently selected from halogen radicals, monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms, monovalent hydrocarbonoxy radicals containing from 1 to about 14 carbon atoms, and halogen substituted monovalent hydrocarbon radicals containing from 1 to about 14 carbon atoms,

n, n^1 and n^2 are independently selected from integers having a value of from 0 to 4 inclusive, and

A is selected from alkylene, cycloalkylene, alkylidene, cycloalkylidene,



radicals.

4,560,809

ALKYLATION PROCESS

Dixie E. Goins; Harold V. Huggins; Edward A. Burt, all of Orangeburg, and Silas W. Holmes, Columbia, all of S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 9, 1984, Ser. No. 658,523

Int. Cl.[4] C07C *37/11, 38/06*

U.S. Cl. 568—789 **19 Claims**

1. A process for the production of 2,6-di-alkylphenols wherein the alkyl groups are secondary or tertiary, said process comprising the steps of: (a) reacting at about 100–1000 psig and 75°–250° C. a C_3–C_{20} olefin and a phenolic mixture comprising at least about 70 weight percent phenol and about 20–30 weight percent of a para-alkylphenol mixture comprising mainly 2,4-dialkylphenol and 2,4,6-trialkylphenol wherein the alkyl groups are secondary or tertiary, in the presence of an aluminum phenoxide catalyst to form an alkylation mixture and (b) recovering 2,6-dialkylphenol from said alkylation mixture.

4,560,810

CATALYTIC DEALKYLATION OF ALKYLATED PHENOLS

John J. Talley, Clifton Park; Irene A. Evans, Schenectady, and Michael D. Lewis, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1984, Ser. No. 671,254

Int. Cl.[4] C07C *37/50*

U.S. Cl. 568—805 **12 Claims**

1. A method of dealkylating alkylated phenols containing at least one alkyl group ortho to the hydroxy group which comprises contacting, at a temperature within the range of about 350°–500° C., a combination of at least one such alkylated phenol and water with a catalyst comprising a combination of at least one chromium oxide and at least one of the oxides of zinc, iron, magnesium and manganese.

4,560,811

METAL-MEDIATED HALOHYDRIN FORMATION

Karl B. Sharpless, Brookline, Mass., and Roy A. Johnson, Kalamazoo, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 18, 1984, Ser. No. 571,961
Int. Cl.[4] C07C 29/64, 31/20, 31/34, 33/40
U.S. Cl. 568—848 12 Claims

1. A method for preparing a halohydrin, employing as reactant an olefin and peroxide, said method comprising:

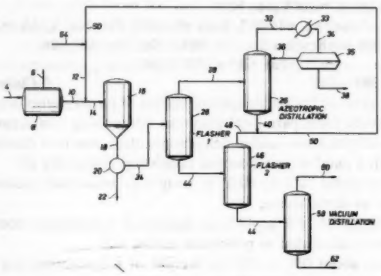
combining said reactant with a heavy metal halide reagent under mild conditions in an inert medium for sufficient time to produce said halohydrin.

4,560,812

RECOVERY OF GLYCERINE FROM SALINE WATERS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1984, Ser. No. 679,773
Int. Cl.[4] C07C 29/80, 29/86, 31/22
U.S. Cl. 568—869 7 Claims



1. A process for recovering glycerine from a glycerine-containing saline aqueous feed stream which comprises:

(a) evaporating said feed stream to remove at least about 90% of the water present in the feed stream to precipate some of the salt content of said feed stream, to obtain a liquid saline glycerine concentrate stream and precipitated salt,

(b) contacting the concentrate stream from step (a) with pentanol consisting substantially of 1-pentanol or a mixture of pentanols at a temperature from about 115°–160° C. in a weight ratio of pentanol to feed from about 1:1 to about 5:1, thereby precipitating a major amount of the salt dissolved in the concentrate stream, and resulting in a liquid concentrate-pentanol mixture,

(c) separating the liquid concentrate-pentanol mixture from the precipitated salt,

(d) introducing said liquid concentrate-pentanol mixture from step (c) into at least one flash zone to separate an overhead fraction comprising substantially pentanol and a minor amount of water, and a glycerine-containing bottoms fraction,

(e) passing at least part of the overhead from step (d) through a water-removal step to obtain a drier overhead fraction having substantially lower water content than the overhead fraction from step (d),

(f) recycling the drier overhead fraction from step (e) to said contacting step (b),

(g) and distilling by vacuum fractionation distillation the bottom fraction from step (d) to obtain glycerine as an overhead fraction.

4,560,813

PROCESSES FOR THE PRODUCTION OF ALKYLENE GLYCOL IN THE PRESENCE OF ORGANOMETALATE

Joseph A. Collier, S. Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 28, 1984, Ser. No. 594,269
Int. Cl.[4] C07C 29/76, 31/20, 31/27, 33/26
U.S. Cl. 568—872 22 Claims

1. A process for the production of alkylene glycols by the hydrolysis of alkylene oxide in the presence of a selectivity-enhancing metalate anion-containing material comprising;

(a) contacting in a hydrolysis zone the alkylene oxide and water under hydrolysis conditions sufficient to produce alkylene glycol in the presence of selectivity-enhancing amounts of metalate anion-containing material, wherein said metalate-anion containing material comprises metalate anion in association with electro-positive complexing sites on a solid and metalate anion is displaced from the electropositive complexing sites during the hydrolysis;

(b) withdrawing an alkylene glycol-containing stream from the hydrolysis zone which alkylene glycol-containing stream contains metalate anion;

(c) contacting the alkylene glycol-containing stream with a solid having electropositive complexing sites thereon which are in association with a replaceable anion wherein the electropositive complexing sites have a greater affinity for the metalate anion than the replaceable anion, said contacting being under conditions such that the content of the metalate anion in the alkylene glycol-containing stream is reduced and

(d) using as at least a portion of the metalate anion-containing material in the hydrolysis zone the solid having electropositive complexing sites after contacting the alkylene glycol-containing stream to remove metalate anion therefrom.

4,560,814

PROCESS FOR ALKYLATING HALOGENATED AND TRIFLUOROMETHYLATED BENZENE COMPOUNDS

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jan. 31, 1984, Ser. No. 575,586
Claims priority, application France, Feb. 2, 1983, 83 01594
Int. Cl.[4] C07C 17/26
U.S. Cl. 570—144 20 Claims

1. A process for alkylating halogenated and trifluoromethylated benzene compounds which comprises reacting an alkyl halide with a benzene compound having two or three substituents selected from the group consisting of the halogens and a trifluoromethyl group and also having a hydrogen atom whose two ortho positions are occupied by two of the said substituents, the reaction being carried out in the presence of at least one alkali metal amide and at least one agent that complexes with the cation of the alkali metal amide to produce a reaction product comprising an alkylated benzene derivative.

4,560,815

AUTOMATED CATALYST REGENERATION IN A REACTOR

Suresh C. Agarwal, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 488,282, Apr. 25, 1983. This application Jan. 26, 1984, Ser. No. 550,440
Int. Cl.[4] C07C 5/03
U.S. Cl. 585—259 4 Claims

1. A method of controlling catalyst regeneration for a hydrogenation process of a hydrocarbon in a reactor, comprising:

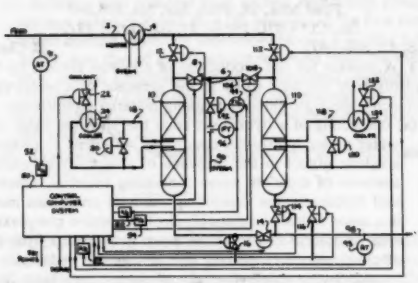
sensing the hydrocarbon raw material concentration in a feed stream of the reactor;

sensing the hydrogen concentration in the feed stream;

sensing the hydrocarbon raw material concentration in an exit stream of the reactor;

calculating an estimated catalyst selectivity according to the relationship,

$$S=C_{H1}/(C_{A1}-C_{A2})$$



wherein S=catalyst selectivity, C_{A1}=hydrocarbon raw material concentration in the feed stream, C_{A2}=hydrocarbon raw material concentration in the exit stream, and C_{H1}=hydrogen concentration in the feed stream; and

regenerating the catalyst of the reactor when the calculated estimated selectivity of the catalyst reaches a selected level.

4,560,816

CATALYZED HYDROGENATION AND DEHYDROGENATION PROCESSES

Milton W. Davis, Jr., Lexington, S.C., assignor to University of South Carolina, Columbia, S.C.

Continuation of Ser. No. 383,786, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 309,768, Oct. 8, 1981, abandoned, which is a continuation of Ser. No. 114,556, Jan. 23, 1980, abandoned, which is a division of Ser. No. 801,388, May 27, 1977. This application Oct. 27, 1983, Ser. No. 546,065

Int. Cl.⁴ C07C *5/10*

U.S. Cl. 585—266 **1 Claim**

1. A method of synthesizing compounds by hydrogenation of benzene which comprises mixing benzene with hydrogen gas and contacting the mixture with a catalyst comprising a solid titanium-iron alloy which is in a form capable of reversible conversion between metallic and hydrided states, at a temperature and pressure at which the catalyst promotes the hydrogenation reaction, and wherein the alloy is selected from the group consisting of binary alloys, ternary alloys and quaternary alloys, where the major components are iron and titanium, and wherein the third component in the ternary alloy and the fourth component in the quaternary alloy are metals or compounds of metals.

4,560,817

HYDROGENATION CATALYST

Rex L. Bobsein, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Ohio

Filed Mar. 2, 1984, Ser. No. 585,666

Int. Cl.⁴ C07C *5/05, 5/03, 5/00*

U.S. Cl. 585—273 **10 Claims**

1. A process for hydrogenating olefin polymers containing phenyl and olefin unsaturation comprising contacting same with hydrogen and ammonia or organic amine in the presence of a catalyst composition consisting essentially of

(a) platinum or palladium,

(b) from about 0.5 to about 50 weight percent of the total composition of at least one alkali or alkaline earth metal alkoxide wherein the alkyl portion contains from 1 to about 10 carbon atoms, and

(c) a support component chosen from group consisting of silica, silica-alumina, and alumina.

4,560,818

PROCESS FOR THE OXIDATIVE DEHYDROGENATION OF ETHYLTOLUENE TO METHYLSTYRENE

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,584

Int. Cl.⁴ C07C *4/12*

U.S. Cl. 585—443 **6 Claims**

1. A process for the oxidative dehydrogenation of p-ethyltoluene to form p-methylstyrene in a selectivity of at least 86%, comprising contacting p-ethyltoluene with oxygen and hydrogen sulfide in the presence of magnesium oxide catalyst, at an elevated temperature; in which the molar ratio of oxygen to hydrogen sulfide is 1.6:1 or greater, and the molar ratio of hydrogen sulfide to p-ethyltoluene is 1.1:1 to 1.5:1.

4,560,819

PROCESS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 449,907, Dec. 15, 1982, Pat. No. 4,503,163. This application Sep. 14, 1984, Ser. No. 650,396

Int. Cl.⁴ C07C *2/64*

U.S. Cl. 585—445 **6 Claims**

1. In a process for the dehydrogenation of para-ethyltoluene to selectively form para-methylstyrene comprising contacting the para-ethyltoluene under dehydrogenation reaction conditions with a catalyst composition consisting essentially of:

(a) from about 30% to 60% by weight or iron oxide, calculated as ferric oxide;

(b) from about 13% to 48% by weight of a potassium compound, calculated as potassium oxide; and

(c) from about 0% to 5% by weight of a chromium compound, calculated as chromic oxide,

the improvement wherein the para-ethyltoluene is contacted with a catalyst composition additionally consisting essentially of a modifying component (d) being capable of enhancing the preferential formation of para-methylstyrene, the modifying component (d) consisting essentially of about 2% to 10% by weight of the catalyst composition of a caLcium compound, calculated as calcium oxide.

4,560,820

ALKYLAROMATIC DEALKYLATION

Leslie A. Field, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 253,976, Apr. 13, 1981, abandoned. This application Oct. 25, 1984, Ser. No. 664,658

Int. Cl.⁴ C07C *4/18*

U.S. Cl. 585—489 **13 Claims**

1. A process for preparing a product having a substantial benzene content from C_7 and higher alkylaromatics, comprising:

(a) contacting a hydrocarbonaceous feed, which comprises dealkylatable C_7 and higher alkylaromatics at a temperature of from about 450° C. to 595° C., with a conversion catalyst, which comprises an intermediate pore size zeolite and platinum or a compound thereof and wherein said zeolite is substantially free of acidity, and has a silica: alumina mole ratio greater than about 10:1, under dealkylation conditions; and

(b) recovering a benzene-containing effluent wherein the benzene content of the C_5^+ aromatics produced is greater than about 75% by weight.

4,560,821

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,650, Aug. 30, 1982, abandoned. This application Aug. 12, 1983, Ser. No. 522,938 The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 43 Claims

1. In a method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane at synthesizing conditions with at least one reducible oxide of at least one metal which oxides when contacted with methane at synthesizing conditions are reduced and produce higher hydrocarbon products and water, said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof, the improvement which comprises:

(a) continuously introducing and contacting the gas comprising methane and particles comprising said reducible metal oxides under synthesizing conditions in a first contact zone to form C_2+ hydrocarbons, coproduct water, and particles comprising a reduced metal oxide;

(b) continuously removing particles comprising a reduced metal oxide from the first zone and contacting the particles with an oxygen-containing gas in a second zone to produce particles comprising a reducible metal oxide; and

(c) returning particles formed in the second zone to the first zone.

4,560,822

PREPARATION OF DIENES BY DEHYDRATION OF ALDEHYDES

Wolfgang Hoelderich; Franz Merger; Wolf D. Mross, all of Frankenthal, and Gerd Fouquet, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

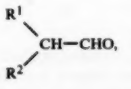
Filed May 3, 1985, Ser. No. 730,687

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419379

Int. Cl.[4] C07C *1/24*

U.S. Cl. 585—606 7 Claims

1. A process for the preparation of a diene, wherein an aldehyde of the formula



I

where R^1 and R^2 are identical or different, R^1 is alkyl with 1 to 3 carbon atoms or hydrogen and R^2 is alkyl with 1 to 8 carbon atoms or a hydrocarbon radical which together with R^1 forms a cyclohexyl radical, is converted at from 150° to 600° C. over a zeolite as a catalyst.

4,560,823

HYDROCARBON DEHYDROGENATION

Anne M. Gaffney, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 600,651

Int. Cl.[4] C07C *5/327*

U.S. Cl. 585—654 13 Claims

1. A method for dehydrogenating dehydrogenatable hydrocarbons which comprises:

(a) continuously introducing and contacting in a first zone at a temperature within the range of about 500°–1000° C. a gas comprising said hydrocarbon and a solid consisting essentially of: (1) a reducible oxide of Ce and (2) at least one member of the group consisting of alkali earth metals, alkaline earth metals, and compounds thereof, said contacting producing dehydrogenated hydrocarbons, coproduct water and solids comprising a reduced Ce oxide;

(b) recovering dehydrogenated hydrocarbons;

(c) continuously removing solids comprising reduced Ce oxide from the first zone and contacting the reduced solids with an oxygen-containing gas in a second zone to produce solids comprising a reducible Ce oxide; and

(d) returning solids formed in the second zone to the f st zone.

4,560,824

HEAT BALANCE CONTROL IN CATALYTIC DEHYDROGENATION OF ISOBUTANE

David C. Spence, Coopersburg, and William A. Schwartz, Fogelsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 7, 1985, Ser. No. 731,423

Int. Cl.[4] C07C *5/38*

U.S. Cl. 585—662 3 Claims

1. In an adiabatic, cyclic fixed bed catalytic process for the production of isobutylene by the catalytic dehydrogenation of isobutane containing at least 98% isobutane by volume, separating the isobutylene from unreacted isobutane and recycling the unreacted material to the catalytic reactor, the improvement for generating heat within the catalytic reactor which comprises:

diluting the incoming fresh feed with n-butane to a concentration of from about 3–7% by weight of the feed; and adjusting the concentration of n-butane within the range of from 3–7% to produce a recycle feed having sufficient butadiene therein to produce additional coke within said dehydrogenation zone and thereby obtain a net heat balance of approximately zero.

4,560,825

ADAMANTANE DERIVATIVE/SURFACTANT CATALYZED PARAFFIN-OLEFIN ALKYLATION

George M. Kramer, Berkeley Heights, and Edwin R. Ernst, Belle Mead, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 599,532, Apr. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 540,120, Oct. 7, 1983, abandoned. This application Dec. 18, 1984, Ser. No. 682,787

Int. Cl.[4] C07C *2/58*

U.S. Cl. 585—724 4 Claims

1. An alkylation process comprising the step of contacting a paraffinic compound, capable of forming a carbonium ion under strong acid conditions, with an olefin in the presence of a strong acid system comprised of an acid component and a mixture of:

(a) one or more adamantane derivative containing at least one unsubstituted bridgehead position and which is capable of being protonated, or hydrogen bonded to, or dissociated by an acid; and

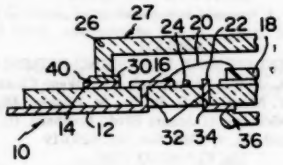
(b) one or more surfactants capable of stabilizing the one or more adamantane derivatives of (a) above at a hydrocarbon-acid interface.

4,560,826

HERMETICALLY SEALED CHIP CARRIER

Carmen Burns, Hershey, and Dimitry Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 29, 1983, Ser. No. 566,769
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 FP 17 Claims



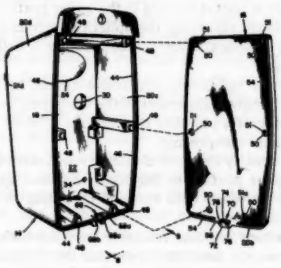
1. A hermetic chip carrier, comprising:
a substrate;
a chip disposed on said substrate;
inner leads disposed on said substrate on the same side as said chip;
a sealing ring disposed on the same side of said substrate as said chip;
electrical power and ground busses disposed adjacent said inner leads;
outer leads disposed on said substrate on the side opposite said chip in a pattern corresponding to said inner leads and said electrical power and ground busses;
pedestal disposed in vias in substrate, said pedestal electrically interconnecting said inner leads and said electrical power and ground busses to corresponding outer leads; and
a diaphragm having a sealing skirt attached thereto wherein said sealing skirt is disposed on and attached to said sealing ring.

4,560,827

ELECTRIC FENCER UTILIZING A SEALED PLASTIC HOUSING

Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026

Filed Jan. 23, 1984, Ser. No. 572,708
Int. Cl.[4] H05K *5/06*
U.S. Cl. 174—52 S 12 Claims



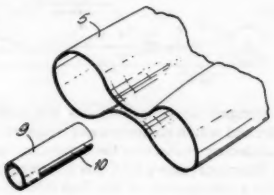
1. An electric fencer comprising a housing including a casing having a front wall and integral side walls extending rearwardly from said front wall to provide rear edges on said side walls residing in a plane spaced from said front wall, a number of spaced pins extending rearwardly from the plane of said rear edges and located inwardly adjacent said rear edges, and a flat rear panel having a number of recesses registrable with said pins, said pins being anchored within said recesses to retain said rear panel in place against the rear edges of said side walls.

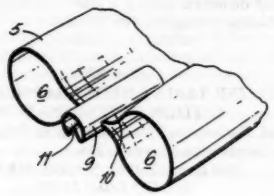
4,560,828

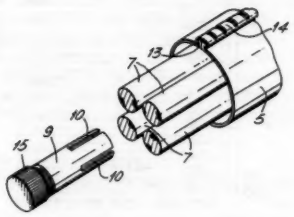
TUBULAR ARTICLE FOR BRANCH-OFF SEAL

Joris R. I. Franckx, Bonheiden; Luiz N. Mendes, Kessel-Lo; Lodewijk van Noten, Louvain, and Thierry Touchais, Brussels, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 10, 1983, Ser. No. 493,310
Claims priority, application United Kingdom, May 11, 1982, 8213675
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—71 R 12 Claims







1. An enclosure for a branch-off between at least two elongate substrates, which comprises:
a recoverable sleeve which can surround the branch-off; and
a clip comprising a tubular body having circumferentially spaced apart at least first and second longitudinal slits or pairs of slits, such that within each slit or pair of slits two thicknesses of an end portion of the sleeve can be received in close fitting engagement to form at least two conduits in the end portion of the sleeve.

11. A splice in a supply line having a branch off enclosed by an enclosure comprising:
a recoverable sleeve which can surround the branch-off; and
a clip comprising a tubular body having circumferentially spaced apart at least first and second longitudinal slits or pairs of slits, such that within each slit or pair of slits two thicknesses of an end portion of the sleeve can be received in close fitting engagement to form at least two conduits in the end portion of the sleeve.

4,560,829

FOAMED FLUOROPOLYMER ARTICLES HAVING LOW LOSS AT MICROWAVE FREQUENCIES AND A PROCESS FOR THEIR MANUFACTURE

Donald A. Reed, 465 Seventh Ave., and Hans E. Lunk, 1145 Monte Rosa Dr., both of Menlo Park, Calif. 94025

Filed Jul. 12, 1983, Ser. No. 513,482

Int. Cl.[4] B29D *27/00;* **H01B** *11/18, 13/24;* **H01P** *3/06*

U.S. Cl. 174—102 R **20 Claims**

1. An elongate article which has low loss at microwave frequencies and which comprises an elongate conductor and an elongate dielectric contacting the conductor and composed of a foamed fluoropolymer which has a melting point of at least 150° C. and a loss tangent of less than 0.0015, which has been melt-extruded around the conductor, and which contains residues of a foaming agent used to foam the polymer, the foaming agent having the formula C_nF_{2n+2}, wherein n is at least 3, and the foamed dielectric having a loss contribution of less than 0.14 dB/foot at a frequency of 10 GHz.

4,560,830

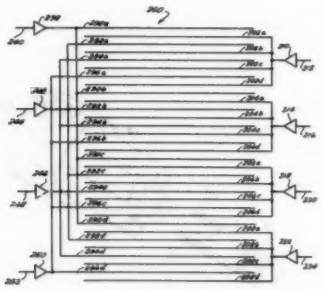
DIGITIZER TABLET WITH COARSE AND FINE POSITION DETERMINATION

Julius Perl, Burlington, Mass., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Dec. 22, 1983, Ser. No. 564,267

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **20 Claims**



18. A grid of electrical conductors for use in an electrographics system for determining at least one coordinate position of a stylus relative to said grid comprising:

(a) a first plurality of substantially parallel electrical conductors lying in a plane, each of said conductors being spaced one from another by a predetermined distance, the conductors of said first plurality being divided into groups each comprising a predetermined number of juxtaposed conductors, all of the conductors of each group being connected together;

(b) a second plurality of substantially parallel conductors being interleaved with, and substantially coplanar with said first plurality, each of said conductors of said second plurality being spaced one from another by said predetermined distance to form a series of conductor pairs containing juxtaposed conductors of each of said pluralities; the conductors of said second plurality being divided into groups each comprising a predetermined number of conductors, each of the conductors of the group being spaced one from the other by the number of groups of conductors in said first plurality, all of the conductors of each group being connected together;

each of the groups of both said first and second pluralities being adapted to be connected to separate drivers whereby the number of drivers required is equal to substantially twice the square root of the number of conductor pairs.

4,560,831

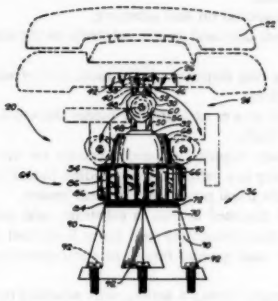
MOBILE TELEPHONE MOUNTING PEDESTAL

Gordon B. Bast, 3N060 Woodcreek La., West Chicago, Ill. 60185; Carl W. Metz, 804 S. 4th St., St. Charles, Ill. 60174, and John F. Nicholas, 41 Janata Blvd., Lombard, Ill. 60148

Filed Jul. 9, 1984, Ser. No. 629,019

Int. Cl.[4] H04Q *7/04*

U.S. Cl. 179—2 E **11 Claims**



1. A mobile telephone mounting pedestal for use in mounting a telephone instrument in a vehicle comprising:

a base having a circular upper portion, a lower portion for mounting the base to a vehicle, and means for securing the lower portion to a vehicle;

an articulating telephone mounting arm including an upper end thereof for connection to a telephone instrument and a lower end terminating toward the upper portion of said base;

means for axially adjusting the telephone mounting arm relative to the base, comprising:

(a) a spherical element attached to and defining a lower terminus of the telephone mounting arm;

(b) a spherical socket located in the upper portion of the base for matingly receiving the spherical element, the socket and the spherical element constituting a ball-and-socket joint; and

(c) means for tightening and releasing the ball-and-socket joint to facilitate ajustment of the telephone mounting arm in any one of a plurality of positions relative to the base, such means comprising:

(i) an internally threaded annular crown skirting the circular upper portion of the base, the base upper portion being provided with external threading to receive the annular crown;

(ii) a unitary annular rotatable pressure-fitting mounted between the annular crown and the spherical element, the pressure-fitting being provided with an inner upper surface circumferentially contacting the spherical element at a height thereon above a widest circumference of the spherical element; and

(iii) means for engagement between the pressure-fitting and the annular crown such that manual rotation of the crown, causing the same to skirtingly descend the threaded upper portion of the base, results in downward force on both the pressure-fitting and the spherical element,

whereby manual rotation of said threaded annular crown

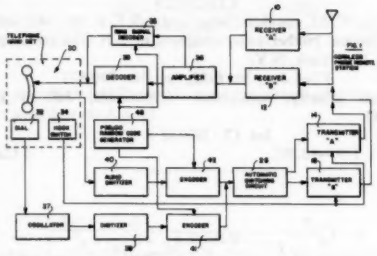
loosens or tightens said pressure-fitting which permits loosening and retightening of said ball and socket joint whenever it becomes necessary to adjust the position of the telephone mounting arm for the comfort of the user.

4,560,832

TELEPHONE SYSTEM

Raymond G. Bond, Long Beach, and Masroor A. Batla, Saugus, both of Calif., assignors to T.A.D. Avanti, Inc., Compton, Calif.

Filed Feb. 27, 1984, Ser. No. 583,991
Int. Cl.[4] H04Q 7/04; H04K 1/00
U.S. Cl. 179—2 EA 5 Claims



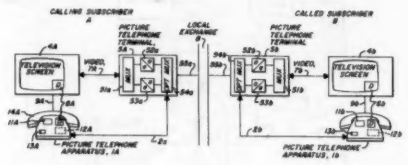
1. A cordless telephone system comprising a base station including base radio transmitter means and base radio receiver means, and a remote station including a telephone handset, remote radio receiver means, and remote radio transmitter means; said base station further including first circuit means connecting said base radio receiver means to a telephone line for applying to the telephone line audio signals received by said base radio receiver means from the remote transmitter, and second circuit means connecting the telephone line to the base radio transmitter means for applying audio signals received over the telephone line to the base radio transmitter means for transmission thereby to the remote receiver means; said remote station further including third circuit means connecting said remote receiver means to the handset for supplying audio signals received from the base transmitter means by said remote receiver means to the handset, and fourth circuit means connecting the handset to said remote transmitter means for applying audio signals received from the handset to said remote transmitter means for transmission thereby to the base receiver means; first and second encoder means respectively included in the second and fourth circuit means for encoding the audio signals transmitted between the remote station and the base station; first and second decoder means respectively included in the first and second circuit means for decoding the audio signals applied to the handset and to the telephone line; said base station including further circuit means connecting said telephone line to said base radio transmitter means for causing said base radio transmitter means to transmit ring signals received over the telephone line to the remote radio receiver means, and further encoder means included in said further circuit means for encoding the ring signals; said remote station including circuit means connecting said remote receiver means to the handset for supplying ring signals received from the base station to the handset, and further decoder means included in said last-named circuit means for decoding the ring signals; said remote station including encoder means connected to the handset for coding the dial pulses from the handset, and means connecting said last-named encoder means to said remote transmitter means for causing said remote transmitter means to transmit coded dial pulses to said base station, and said base station including a dial pulse decoder for decoding the coded dial pulses received from the remote station, and means connecting the dial pulse decoder to the telephone line.

4,560,833

METHOD AND APPARATUS FOR SIGNALING AN EXISTING TELEPHONE COMMUNICATION BETWEEN PICTURE TELEPHONE APPARATUSES

Jens Weber, and Ernst-Michael Czempiel, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,553
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304509
Int. Cl.[4] H04N 7/14
U.S. Cl. 179—2 TV 12 Claims



1. A method for signaling a capability of a picture telephone communication between picture telephone subscriber equipments each including a picture telephone apparatus having a handset, said telephone subscriber equipments being interconnected via a communications path including an audio channel in such a way as to constitute a calling subscriber and a called subscriber comprising the steps of:

generating an identification signal by a picture telephone apparatus of a called subscriber in response to a received call and upon lifting the handset of the picture telephone apparatus of the called subscriber as a picture telephone identification signal;

transmitting said identification signal through an audio channel of a picture telephone transmission channel from the picture telephone apparatus of the called subscriber to a picture telephone apparatus of a calling subscriber;

receiving said identification signal by the picture telephone apparatus of said calling subscriber;

detecting said identification signal as the picture telephone identification signal of said called subscriber by the picture telephone apparatus of said calling subscriber; and

generating an indication signal upon detecting said picture telephone identification signal by the picture telephone apparatus of said calling subscriber indicating that the called subscriber has a picture telephone equipment.

4,560,834

CURRENT LIMITER CIRCUIT FOR BATTERY FEED IN A TELEPHONE CIRCUIT

John M. Huft, Lakewood, Colo., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Apr. 29, 1983, Ser. No. 490,019
Int. Cl.[4] H04M 1/76
U.S. Cl. 179—16 F 3 Claims

1. Apparatus for controlling subscriber line current supplied from an orifice battery to a subscriber telephone station via a subscriber loop circuit comprising:

a DC voltage source;

a first resistor;

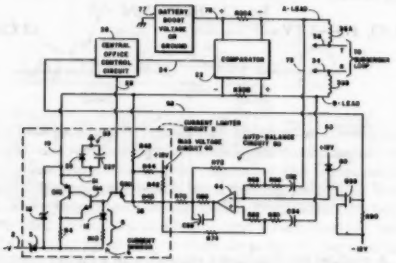
a first transistor means having base, emitter and collector electrodes; an emitter-collector path of said first transistor being operated as a switch means having an input electrically connected through said first resistor to said DC voltage source and an output;

first means for electrically connecting the output terminal of said first transistors emitter-collector path to said office battery and being responsive to conduction of said first transistor for establishing a reference voltage at the input terminal of the latter;

base drive means electrically connected to the base electrode

of said first transistor for turning on said first transistor when office battery current is to be supplied to the subscriber loop circuit, conduction of said first transistor developing a reference voltage at the input terminal thereof;

a current amplifier circuit having a first terminal electrically connected to the output terminal of said first transistors emitter-collector path, having a second terminal electrically connected to the office battery, and having a third



terminal electrically connected to the subscriber loop circuit; and

a second resistor electrically connected between said third terminal of said current amplifier circuit and the input terminal of said first transistors emitter-collector path whereby one of voltage and current provided at the input terminal of said first transistors emitter-collector path is made dependent upon the resistance of the subscriber loop for controlling the magnitude of the subscriber loop current.

4,560,835

POWER SUPPLY ARRANGEMENT FOR APPLYING DIRECT CURRENT TO SUBSCRIBER CIRCUITS

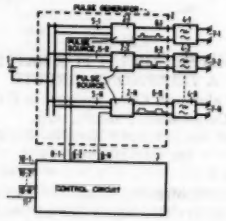
Wouter Bourgonje, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,501

Claims priority, application Netherlands, Jul. 12, 1982, 8202812

Int. Cl.⁴ H02P *13/26;* H04M *3/00*

U.S. Cl. 179—16 AA **5 Claims**



1. A power supply arrangement for supplying direct current to a plurality N (N=2, 3, 4 . . .) of subscriber circuits in a telephone system, comprising:

a controllable pulse generating arrangement comprising N controllable pulse sources for connecting the respective subscriber circuits to a central source of direct current;

a control arrangement connected to each of said pulse sources for applying control signals thereto which cause them to supply pulses of current from said central source to the respective subscriber circuits, the duration of the current pulses produced by each of said pulse sources being controlled by the control signals applied thereto;

and a plurality of smoothing circuits connected between the respective subscriber circuits and said pulse sources for converting the current pulses produced thereby into smoothed direct current;

said control arrangement comprising a phase control circuit for producing relative phase differences between the start of each the control signals applied to respective ones of said pulse sources, whereby relative phase differences are produced between the start of each current pulse produced by said pulse sources.

4,560,836

FOUR-WIRE COMMUNICATION LINE CIRCUIT AND CONFERENCE NETWORK COMPRISING SUCH CIRCUITS

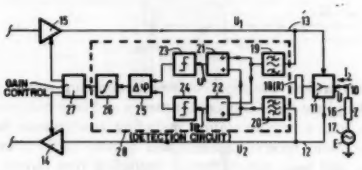
Adrianus W. M. van den Enden, and Job F. P. van Mil, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,821

Claims priority, application Netherlands, Jul. 2, 1982, 8202667

Int. Cl.⁴ H04M *3/56*

U.S. Cl. 179—18 BC **4 Claims**



1. A four-wire communication line circuit comprising a first amplifier for signal voltages transmitted in one direction and a second amplifier for signal voltages transmitted in the opposite direction on such communication line; control means for switching the gain factor of each of said amplifiers between a high value and a low value; a hybrid circuit for coupling the four-wire communication line to a two-wire subscriber line for two-way communication thereon; and a transmission direction detection circuit coupled to the four-wire communication line for generating a control signal for the control means dependent on the direction in which net energy is transmitted on the two-wire subscriber line, such detection circuit comprising: adding means coupled to the four-wire communication line for obtaining the sum of the signal voltages transmitted thereon, subtracting means coupled to the four-wire communication line for obtaining the difference of the signal voltages transmitted thereon, and phase difference detecting means coupled to the adding and subtracting means for deriving said control signal from the phase difference between said sum and difference voltages.

4,560,837

CALL TRANSFER METHOD AND CIRCUITRY

Robert A. Carson, Indianapolis, Ind.; Francis M. Fenton, and David F. Jones, both of Middletown, N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Aug. 15, 1983, Ser. No. 523,092

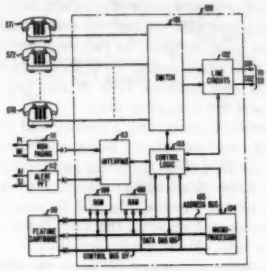
Int. Cl.⁴ H04M *3/58;* H04Q *1/30*

U.S. Cl. 179—18 BD **11 Claims**

8. A call transfer method for use in a telephone communication system having a plurality of station sets for answering a telephone call in response to a received call ring signal, said method comprising the steps of:

transferring an answered call from a first station set to a second station set in response to a transfer signal from said first station set, and

generating during said answered call and in response to said transfer signal a transfer ring signal for said second station



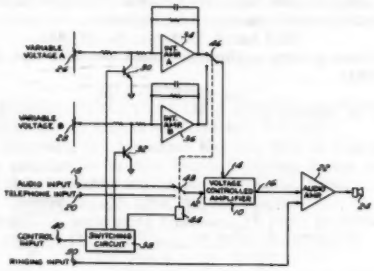
set which is different from said received call ring signal at said first station set.

4,560,838

APPARATUS FOR INTEGRATING A PLURALITY OF AUDIO SYSTEMS

William L. Meisenheimer, Agoura, Calif., assignor to Water Jet Corporation, Canoga Park, Calif.

Filed Jan. 20, 1984, Ser. No. 572,701
Int. Cl.[4] G09B 5/04; H04M 1/00
U.S. Cl. 179—81 R **7 Claims**



1. An apparatus for integrating a plurality of audio systems, adapted to enable selection of one of a plurality of audio input signals, and to enable the selected one of the plurality of audio input signals to be transmitted as an audio output signal, comprising:

(a) means for enabling selection of one of the plurality of audio input signals;

(b) means for controlling the selected audio input signal responsive to a direct-current control voltage;

(c) a plurality of parallel means for generating the direct-current control voltage, each associated with an audio input signal; and

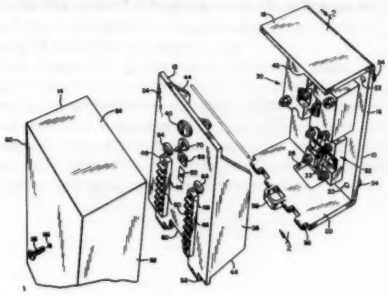
(d) means for automatically selectively switching the control voltage generating means and the audio input signals relative to the signal controlling means so as to connect one of the control voltage generating means and the associated selected audio input signal to the signal controlling means responsive to a control input signal generated in association with the selected one of the plurality of audio input signals.

4,560,839

TELEPHONE JUNCTION BOX

John T. Dillard, 455 Fifth Ave., Box 198, Monroe, Oreg. 97456

Filed Sep. 12, 1983, Ser. No. 531,394
Int. Cl.[4] H04M 9/00
U.S. Cl. 179—81 C **7 Claims**



1. A telephone junction box comprising

(a) a base member having a rear wall with front and rear surfaces,

(b) means on said base member arranged to mount it on a building with said rear surface facing the building,

(c) means on the front surface of said base member arranged to mount incoming telephone supply equipment,

(d) a first cover enclosing portions of said base member and having locking engagement with said base member in an arrangement to allow access within said cover and to the front surface of said base member only to authorized telephone company workmen,

(e) said first cover having a customer access plate with front and rear surfaces,

(f) mounting means on said first cover arranged to support customer access equipment on the front surface thereof for telephone service lines and arranged to provide connection between the customer access equipment and the incoming telephone supply equipment,

(g) said mounting means supporting the customer access equipment in exposed position for access by the customer whereby the customer can make connections for service but does not have access to the incoming telephone supply equipment in said base member,

(h) a second cover enclosing both of said base member and said first cover,

(i) and means accessible to a customer detachably securing said second cover to the assembly of said base member and said first cover for enclosing said assembly or for gaining access to said customer access equipment on said first cover.

4,560,840

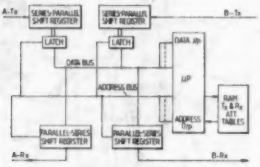
DIGITAL HANDSFREE TELEPHONE

Bjorn N. Hansen, Haverhill, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,579
Claims priority, application United Kingdom, Mar. 1, 1983, 8305572
Int. Cl.[4] H04M 1/60
U.S. Cl. 179—81 B **2 Claims**

1. An electrical circuit for use in a handsfree telephone, wherein there are separate channels for outgoing speech and for incoming speech, comprising: Codec means for sampling each said channel at preset intervals and for coupling the results of the samplings, which represent the amplitudes of the speech in those channels, to processor means having an algorithm for comparison of said samplings with a stored threshold

amplitude, wherein information representative of the level of the background noise in the channels is monitored and the threshold amplitude for each said channel is adjusted so as to be at least equal to the noise level as monitored, and wherein each said channel includes an attenuator means having a look-up table whose value is adjusted according to the results of the comparisons, such that each said speech channel is enabled or disabled according to the comparison results, and so that a



channel on which the current threshold amplitude has been exceeded is enabled while a channel in which the current threshold amplitude has not been exceeded is disabled, and wherein the processor includes a memory having a number of control words each of which when read out is used to control the adjustment of a said look-up table to one of a number of preset values, and wherein when the noise level as monitored is found to have changed a corresponding adjustment is made to the values of said control words.

4,560,841

TELEPHONE STATION WHICH IS MAIN OR REMOTELY SUPPLIED

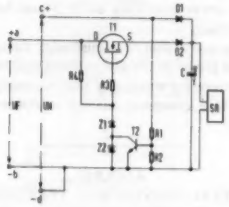
Hans-Joachim Pierrel, Mering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,078

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333791

Int. Cl.[4] H04M *19/08*

U.S. Cl. 179—81 R **1 Claim**



1. A circuit for changing as required the power supply of a telephone station between electrical mains and a remote source which is placed across a subscriber line, the station having a switching regulator with an output for delivering a constant voltage to the station and an input bridged by a buffer capacitor having first and second plates, comprising:

a forward-biased first diode connected between the first plate and a positive side of a DC power supply device fed by electrical mains;

a field effect transistor having its drain-source circuit connected to a positive side of the subscriber line;

a forward-biased second diode connected between the drain-source circuit of the field effect transistor and the first plate;

a two resistor, series-connected voltage divider connected between the positive side of the DC power supply device and a negative side thereof, the voltage divider having a common point between its two resistors and being connected at its negative end to the second plate of the buffer capacitor and negative sides of the DC power supply device and the subscriber line;

a series network containing a resistor and first and second Zener diodes, the resistor being connected between the gate of the field effect transistor and the first Zener diode, the first Zener diode being connected between the resistor and the second Zener diode, and the second Zener diode being connected between the first Zener diode and said negative sides of said device and line;

a fourth resistor connected between the gate of the field-effect transistor and the positive side of the subscriber line; and

a second transistor having its base connected to said common point between said first and second resistors, its emitter connected to said negative sides of said device and line, and its collector connected to a common point between the first and second Zener diodes.

4,560,842

TELECOMMUNICATION SYSTEM LOOP-BACK UNIT

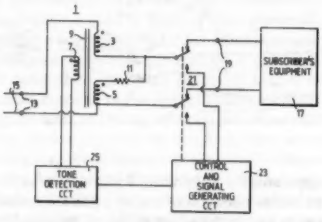
Joseph A. Homer, Manchester, England, assignor to The General Electric Company, p.l.c., England

Filed Apr. 4, 1983, Ser. No. 481,843

Claims priority, application United Kingdom, Apr. 5, 1982, 8210034

Int. Cl.[4] H04B *3/46*

U.S. Cl. 179—81 R **6 Claims**



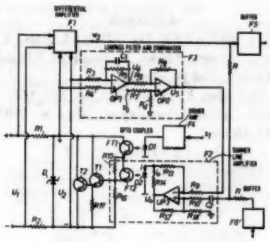
1. A loop-back unit for connection at the subscriber's end of a line of a telecommunication system to provide a loop-back facility comprising: a first pair of terminals for connection to the line; a transformer having first, second and third windings, the first and second windings being connected in series, in the same sense, between said first pair of terminals and the first winding having a relatively low inductance compared with the second winding; signal detection means connected across said third winding; a second pair of terminals for connection to a subscriber's equipment; switching means whereby said second winding may be connected to or disconnected from said second pair of terminals; and control means responsive to detection of a signal by said detection means to operate said switching means to disconnect said second pair of terminals from said second winding temporarily and apply a predetermined signal to the line whilst the subscriber's equipment is so disconnected.

4,560,843

ELECTRONIC EXTERNAL LINE REPEATER

Lars A. Lenell, Saltsjö-Boo, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 21, 1983, Ser. No. 459,977
Claims priority, application Sweden, Feb. 9, 1982, 8200740
Int. Cl.[4] H04B 1/58
U.S. Cl. 179—170 NC 4 Claims



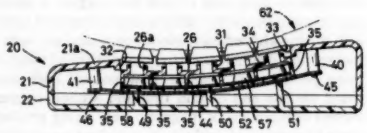
1. An electronic external line repeater for connecting a two-wire line to a four-wire line having incoming and outgoing paths comprising amplifier means connected across the two wire line for feeding speech signals to the outgoing path of the four-wire line, optocoupler means having an output and an input, output amplifier means for connecting the output of said optocoupler means to the two wire line, a self-compensating negative feedback means having an input and an output, high resistance means for connecting the input of said self-compensating negative feedback means to the two wire line, and summing amplifier means having a first input connected to the output of said self-compensating negative feedback means, a second input connected to the incoming path of said four-wire line and an output connected to the input of said optocoupler means.

4,560,844

KEY-HOLDING STRUCTURE OF A KEYBOARD WITH CURVED OPERATING SURFACE OF KEYS

Toshiro Takamura, and Muneharu Kakumu, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha and Sohwa Seiki Kabushiki Kaisha, both of Nagoya, Japan

Filed Jun. 25, 1984, Ser. No. 624,395
Claims priority, application Japan, Jul. 11, 1983, 58-125740; Aug. 17, 1983, 58-127529[U]; Aug. 17, 1983, 58-127530[U]
Int. Cl.[4] H01H 9/00, 13/70
U.S. Cl. 200—5 A 22 Claims



1. A keyboard having multiple key-switches providing electrical outputs upon activation thereof, each of the key-switches including a key having a finger-pressed top face, comprising:

an upper casing which is a one-piece molding made of synthetic resin, including (a) a top frame portion which has a substantially rectangular aperture formed through a thickness thereof and which further has a pair of side walls defining opposite right and left sides of said rectangular aperture, said top frame portion further having a pair of downward extensions which extend downwardly from the respective side walls, and further including (b) a key-holder plate portion of generally planar flat shape which is integral with said top frame portion, said key-holder plate portion supporting the multiple keys in plural rows perpendicular to said right and left sides o the rectangular aperture, said key-holder plate portion having right and left side end regions adjacent to said downward extensions, transversely central areas of said side end regions being materially connected, during molding of said upper casing, to said downward extensions, said key-holder plate portion being spaced from said downward extensions and said top frame portion, except at said transversely central areas of said side end regions; and

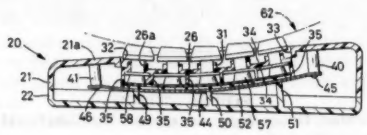
holding means for hoiding said key-holder plate portion curved in cross section across said plural rows of the keys, said holding means having means defining a curvature, and means for holding said key holder plate portion elastically deformed following said curvature, so that a surface generally defined by the top faces of said multiple keys is downwardly convexed in said cross-section.

4,560,845

KEYBOARD

Toshiro Takamura, and Muneharu Kakumu, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha and Showa Seiki Kabushiki Kaisha, both of Nagoya, Japan

Filed Oct. 15, 1984, Ser. No. 661,863
Claims priority, application Japan, Oct. 20, 1983, 58-197036; Oct. 20, 1983, 58-197037
Int. Cl.[4] H01H 9/00, 13/70
U.S. Cl. 200—5 A 14 Claims



1. A keyboard having multiple key-switches each comprising a key having a finger-pressed top face, a movable electrode and at least two stationary electrodes, comprising:

a key holder plate of generally planar flat shape supporting the multiple keys in plural rows movably in a direction perpendicular to a plane of the key holder plate, said key holder plate having holes through which said keys extend and guide portions integrally formed around each of said holes and extending in said direction, said key holder plate further having a deformation-facilitating portion located between at least one pair of adjacent rows of said plural rows of keys, said deformation-facilitating portion having a longitudinal recess array which is formed in parallel to said rows of keys and which consists of a plural total number of longitudinal recesses in upper and lower surfaces of said key holder plate, as viewed in a direction perpendicular to said rows of keys;

retaining means for holding said key holder plate downwardly convexed in cross section across said plural rows of keys, said retaining means defining a curvature and having means for holding said key holder plate elastically deformed following said curvature, whereby a surface generally defined by the top faces of said multiple keys is downwardly convexed in said cross section; and

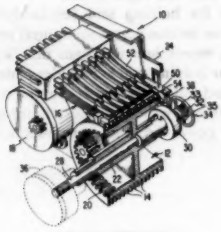
a housing containing said multiple key-switches, said key holder plate and said retaining means.

4,560,846

INCREASED CAPACITY PROGRAM TIMER

Jerome C. Klopp, Arlington Heights, and John Willigman, Elk Grove Village, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 672,520
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **6 Claims**



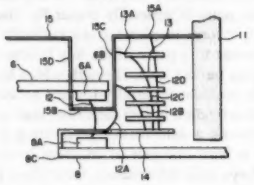
1. A timer having a motor, a rotatable program cam drum having therein a plurality of cam tracks, said drum being coupled to said motor and journalled in a frame for rotation about an axis, a plurality of cam track operated switches, each including a passive blade and an active blade actuated by a respective cam track to engage the associated passive blade as required by said respective cam track as the drum is rotated, a line switch for selectively applying power to said timer, said line switch including a passive blade and an active blade actuated by a slide block, wherein the improvement comprises an additional cam track operated switch including an active blade, a cam follower member associated with one of said cam tracks and arranged to move said additional switch active blade into contact with one of said line switch active blades as required by said one cam track, whereby the line switch position is shared by the line switch and the additional cam track operated switch.

4,560,847

POWER SWITCH

Teijiro Mori, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,749
Int. Cl.[4] H01H *33/08, 33/10*
U.S. Cl. 200—144 R **11 Claims**



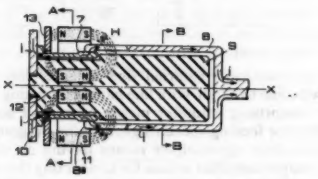
1. An electric power switch comprising:
a stationary contact piece having a stationary contact;
a movable contact piece having a movable contact movable into and out of engagement with said stationary contact;
a commutation electrode arranged near said stationary contact and said movable contact in such a manner that when said movable contact is disengaged from said stationary contact, said commutation electrode located at predetermined distances from said stationary contact and movable contact and receives an arc which is formed between said stationary contact and movable contact;
a plurality of metal arc-extinguishing plates arranged parallel to a surface of said stationary contact piece and at a predetermined distance from said commutation electrode and extending in a direction in which said movable contact piece is moved with respect to said stationary piece; and
said commutation electrode having a generally U-shape and comprising a first part spaced at a predetermined distance from said metal arc-extinguishing plates and disposed parallel to said metal arc-extinguishing plates.

4,560,848

CIRCUIT BREAKER OF SPIRAL ARC TYPE

Satomi Arimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,160
Claims priority, application Japan, May 9, 1983, 58-81882; Jun. 9, 1983, 58-103062
Int. Cl.[3] H01H *33/18*
U.S. Cl. 200—147 A **2 Claims**



1. A circuit breaker of spiral arc type comprising:
a cylindrical fixed contact secured at one end to a terminal plate;
a cylindrical movable contact provided coaxially with respect to said fixed contact and adapted to move in the axial direction between a closed-contact position at which said fixed and movable contacts are in contact with each other and an open-contact position spaced from the position of said fixed contact by a predetermined distance; and
means for producing a magnetic field having a first component intersecting at substantially right angles the common axis of said contacts in front of the front end of said fixed contact and a second component intersecting at substantially right angles the common axis in front of the front end of said movable contact inside a substantially cylindrical space formed between said fixed contact and said movable contact in the open-contact position;
said magnetic field producing means comprising a first magnet located inside said cyindrical space formed between said fixed and movable contacts, a pair of heel pieces provided on both ends of said first magnet, a second magnet disposed coaxially outside said cylindrical space, and a pair of ring-shaped heel pieces provided on both ends of said second magnet, said first component of magnetic field being produced in a space between said heel pieces provided on one end of said first and second magnets, said second component of magnetic field being produced in a space between said heel pieces provided on another end of said first and second magnets.

4,560,849

FEEDBACK REGULATED INDUCTION HEATER FOR A FLOWING FLUID

Albert Migliori, Santa Fe, and Gregory W. Swift, Los Alamos, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

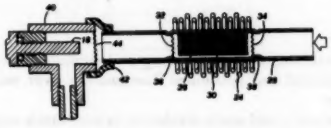
Filed Jun. 13, 1984, Ser. No. 620,287
Int. Cl.[4] H05B *6/08*
U.S. Cl. 219—10.51 **3 Claims**

1. A regulated induction heater for heating a stream of flowing liquid to a predetermined desired temperature, comprising:

a. a radiofrequency (rf) induction coil and a tubular conduit inside said induction coil through which said flowing fluid is passed, a heating element contained within said conduit, said heating element comprising a plurality of stainless steel capillary tubes aligned with the direction of fluid flow, and a variable output rf power supply for energizing said induction coil;

b. temperature sensing means located in said conduit downstream from said heating element for sensing the temperature of the flowing fluid and producing a temperature signal representative thereof; and

c. adjustable proportional and integral feedback control circuit which is responsive to said temperature signal and which produces a temperature error signal representative of the difference between the measured temperature and the desired temperature, said feedback control circuit



including a proportional gain amplifier and an integrating amplifier, said proportional gain amplifier operating in response to said temperature error signal to produce a proportional gain control signal, said integral amplifier operating in response to said temperature error signal to produce an integral gain control signal, said proportional gain control signal and said integral gain control signal being summed to produce a feedback control signal which is applied to said power supply to control the power output thereof and thereby heat the stream of fluid to said predetermined desired temperature, and wherein said proportional gain amplifier has a proportional gain which is set such that said feedback control signal, when applied to said power supply, produces a temperature change in said fluid which is less than the temperature change represented by said temperature error signal.

4,560,850

CONTAINER WITH STEAM PORT FOR USE IN MICROWAVE OVENS

Thomas L. Levendusky, Greensburg, and Arthur Benson, Plum Borough, both of Pa., assignors to Aluminum Company of America, Pittsbugh, Pa.

Filed Dec. 3, 1984, Ser. No. 677,700

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 E **13 Claims**

1. In combination, a container for use in microwave and convection ovens, said container comprising a shallow plastic coated, metal tray having relatively smooth surfaces that inhibit fracturing of the plastic coating, said tray having in plan view an outer side wall provided with rounded corners, each having a radius, said outer side wall terminating in an upper exposed edge, an inner wall disposed within said outer wall, said inner wall having rounded corners, each with a radius, said radius of each of said rounded corners of said outer side wall and said inner wall having a substantial length which serves to reduce or prevent microwave energy from concentrating in a microwave oven, said inner wall also defining a steam port, said walls being connected by an integral bottom portion, and a plastic, microwave transparent lid for seating on the tray's upper exposed edge without blocking the steam port such that steam produced in the tray during heating may escape through the steam port and travel along the tray's bottom, thereby heating the tray bottom and thus the tray's contents.

4,560,851

SINGLE-ENDED PUSH-PULL INDUCTION HEATING APPARATUS

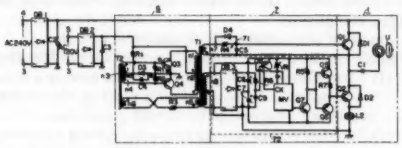
Kazuyoshi Tsukamoto, and Etsuo Sakoguchi, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Nov. 5, 1982, Ser. No. 439,612

Claims priority, application Japan, Nov. 5, 1981, 56-177910; Nov. 5, 1981, 56-177911; Nov. 12, 1981, 56-169186[U]; Mar. 25, 1982, 57-48285; Mar. 30, 1982, 57-52734; Mar. 30, 1982, 57-52735

Int. Cl.[4] H05B *1/02, 6/06, 6/64*

U.S. Cl. 219—10.77 **28 Claims**



1. An induction heating apparatus comprising:

a direct current power source having a high electric potential terminal and a low electric potential terminal;

a first switching element and a second switching element connected between the high electric potential terminal and the low electric potential terminal of said direct current power source and connected in series with each other;

said first switching element being disposed on the side of the high electric potential terminal of said direct current power supply and said second switching element being disposed on the side of the low electric potential terminal;

a load circuit connected in parallel with said first switching element and includes an induction heating coil and a resonance capacitor;

a first controlling circuit for turning said first swtiching element on/off in a predetermined cycle;

a second controlling circuit for turning said second switching element on during an arbitrary time period during an off interval of said first switching element;

input adjusting means operatively coupled to said second controlling circuit for adjusting an on interval of said second switching element so that an input to said load circuit is adjusted, said input adjusting means including means acting on said signal generating means for varying said time width of said second driving signal; and

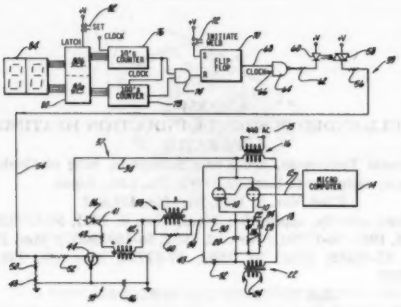
an oscillating circuit for providing a control input to said first controlling circuit and said second controlling circuit wherein said first controlling circuit includes first signal generating means responsive to an output from said oscillating circuit for generating a first driving signal having a predetermined time width for driving said first switching element and said second controlling circuit includes second signal generating means responsive to an output from said oscillating circuit for generating a second driving signal for driving said second switching element.

4,560,852

SPIKE WELDING SYSTEM HAVING IMPROVED POWER SUPPLY

Roger G. Reynolds, Pontiac, Mich., assignor to Weldex, Inc., Warren, Mich.

Filed Nov. 19, 1984, Ser. No. 672,746
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—113 **14 Claims**



1. Power supply apparatus for use with an electrical pulse welder, comprising:

a source of alternating current electrical power;

a firing circuit coupled with said power source including

(1) a transformer having a primary and having a secondary adapted to be coupled with welding electrodes for delivering a current pulse to said electrodes,

(2) electrical power storage means for storing a quantity of electrical energy sufficient in magnitude to produce said current pulse,

(3) first switching means for switching said power source, said storage means, and said primary of said transformer into series circuit with each other, whereby to transfer said quantity of electrical energy from said storage means to said primary; and

means for precharging said storage means with said quantity of electrical energy prior to switching said power source into circuit with said storage means, said precharging means including

(1) means for manually selecting the quantity of electrical energy with which said storage means is precharged,

(2) means responsive to said selecting means for generating a count corresponding to the number of cycles of said alternating current from said power source required to precharge said storage means with the selected quantity of electrical energy,

(3) means for storing the count generated by said count generating means,

(4) a manually operable switch for controlling said firing circuit to generate an electrical welding pulse, and

(5) second switching means responsive to the count stored in said storing means and to said manually operable switch for switching said power source into circuit with said storage means for a duration corresponding to the count stored in said storing means.

4,560,853

POSITIONING AND BONDING A DIAMOND TO A STYLUS SHANK

Douglas H. Ziegel, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

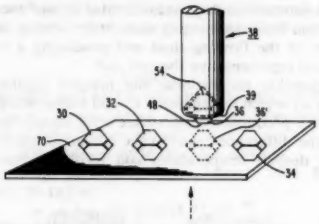
Filed Jan. 12, 1984, Ser. No. 570,231
Int. Cl.[4] B23K *26/02*
U.S. Cl. 219—121 LD **20 Claims**

20. A method for bonding a diamond stone to a metallic shank wherein the improvement comprises the steps of:

(a) providing on a surface at least one diamond stone;

(b) providing an indentation at one end of said shank conforming to a portion of said stone;

(c) wetting the indentation of said shank with an agent for wetting said indentation and capable of wetting said stone;



(d) orienting said shank along its longitudinal axis with its indented end positioned downwardly over said surface; and

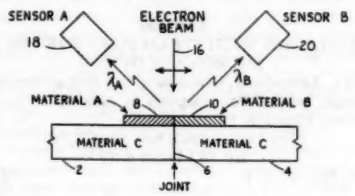
(e) moving said surface relative to said shank end so as to wet sufficiently said stone to draw said stone into said indentation.

4,560,854

ELECTRON BEAM WELDER CONTROL

Henry A. Domian, and Charles M. Weber, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 27, 1983, Ser. No. 566,120
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EW **2 Claims**



1. In an apparatus for maintaining the point of impact of an electron beam in the intended weld line between two weldments of the same material, a first means generating a first primary output signal predominantly of a specific wave length and proportional in magnitude to the radiation generated by the electron beam and impinging on one side of the weld line, a second means generating a second primary output signal predominantly of a specific wave length and proportional in magnitude to the radiation generated by the electron beam and impinging on the other side of the weld line, a difference unit responsive to said primary output signals generating an output signal available for the control of the transverse poisitioning of the electron beam to maintain the point of impact of the electron beam in the intended weld line between the two weldments, said first and second means each include a band of material affixed to a weldment and tracking the intended weld line exposed to the total radiation generated by the electron beam and emitting radiation predominantly of a specific wave length with the radiation emitted by the bands of material being predominantly of different specific wave lengths.

4,560,855

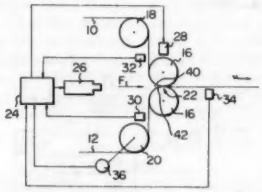
METHOD FOR JOINING OF ARTICLES BY ENERGY BEAM AND APPARATUS FOR CONTROLLING SAID METHOD

Hideo Takafuji; Katsuhiro Minamida, and Shigehiro Yamaguchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 415,936, Sep. 8, 1982. This application Jun. 25, 1984, Ser. No. 624,184

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LD 1 Claim



1. A method for joining of articles comprising the steps of: bringing said articles partly in contact with each other and forming a wedge-shaped space between the non-contact part of said articles, the interior contact part of said wedge-shaped space forming a weld zone, and projecting at least one energy beam into said wedge-shaped space, said energy beam being scanned over the width of the articles, said energy beam having a thickness in the perpendicular direction to the welding width direction, so that said energy beam is reflected from the walls of the wedge-shaped space, thereby effecting heating and joining of said weld zone.

4,560,856

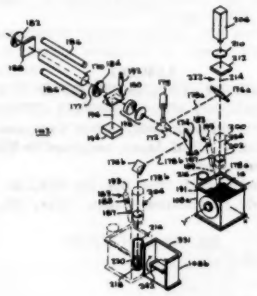
PULSED LASER MACHINING APPARATUS

Richard A. Miller, North Huntingdon, and George D. Bucher, Allison Park, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,264

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LC 19 Claims



1. Laser machining apparatus for generating and precisely directing a laser beam onto a machining site of a work piece, said laser machining apparatus comprising:

(a) a laser source for emitting a laser beam in the form of laser pulses;

(b) means for focusing precisely the laser beam along a laser path to the machining site;

(c) radiation sensitive means oriented with respect to the laser path to receive radiation reflected from a weld site aligned with respect to the laser path and responsive to the reflected radiation for providing an output signal indicative of the level of the reflected radiation; and

(d) alignment detection means coupled to receive the output signal for measuring the rate of increase of the output signal during the machining of the machining site and for comparing the measured rate of increase of the output signal indicative of the level of the reflected radiation with respect to a minimum acceptable rate of increase of said output signal to determine whether the machining site has been aligned precisely with respect to the laser path.

4,560,857

CONSUMABLE ELECTRODE TYPE ARC WELDING APPARATUS HAVING A SELECTABLE START CURRENT

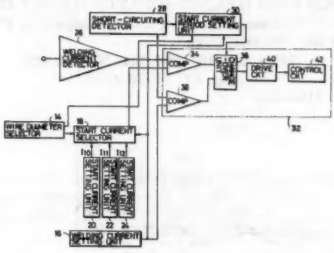
Hirohisa Segawa; Motoe Kitani; Takao Shimizu, and Masanori Mizuno, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,524

Claims priority, application Japan, Feb. 21, 1983, 58-27263; Feb. 21, 1983, 58-27264

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—130.21 15 Claims



1. A consumable electrode type arc welding apparatus comprising:

a wire electrode fed to a workpiece to be welded;

a start current selector for selecting a predetermined limited start current according to predetermined welding conditions, said start current selector comprising means for selecting a best one of a plurality of start currents which have been set by a plurality of start current setting units;

a welding current setting unit for setting a welding current;

a welding current detector for detecting a welding current flowing to said wire electrode and said workpiece;

a short-circuiting detector for detecting the occurrence of short-circuiting between said wire electrode and said workpiece and providing a detection signal accordingly;

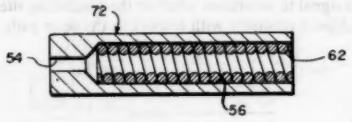
a start current period setting unit for setting a start current period according to said welding conditions in response to said detection signal from said short-circuiting detector; and

a start current control circuit for supplying said start current selected by said start current selector to said wire electrode and said workpiece for a period of time set by said start current period setting unit at the start of arcing, and for supplying a welding current set by said welding current setting unit in response to a signal from said welding current detector.

4,560,858
LONG WEARING CONTACT TIP FOR INERT GAS ARC WELDING

Phillip R. Manning, Hampton, Va., assignor to Ashton Wray, Jr., Hampton, Va., a part interest

Filed Aug. 28, 1984, Ser. No. 644,999
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—137.52 **15 Claims**

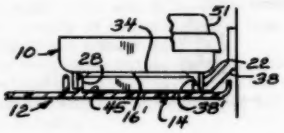


8. A contact tip for use in an inert gas arc welding gun comprising an elongated electrically conductive member having a longitudinally extending bore therethrough, the member having an inlet end adapted for connection to a welding gun and for receiving within the bore a consumable wire electrode fed through the welding gun, and having an outlet end, a first portion of the bore extending from the inlet end to an intermediate location of the member being formed to have a larger cross sectional dimension than a second portion of the bore extending from the intermediate location to the outlet end, and an elongated spiral wound wire liner disposed within the first portion of the bore.

4,560,859
DISH FOR USE WITH MEAL TRAY FEEDING SYSTEM WHICH USES HEATER SHELVES TO LIFT DISHES

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

Filed Aug. 10, 1984, Ser. No. 640,052
Int. Cl.⁴ H05B *1/00*
U.S. Cl. 219—386 **3 Claims**

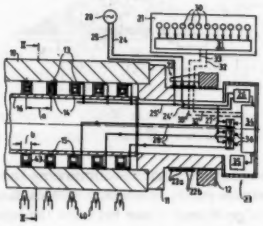


1. A rectangular dish having a generally flat bottom surface portion, said dish being adapted for use with a meal tray feeding system which incorporates a thin heater shelf having a cantilevered, generally horizontally extending support portion and a heater pad portion which is adapted to heat the said generally flat bottom surface portion of the dish, and a tray having at least two closely spaced sets of parallel, aligned, upstanding rib portions, said tray further having a pair of spaced apart transverse portions, said transverse portions cooperating with portions of each of said spaced sets of rib portions which are most remote from each other to retain the dish against longitudinal movement relative to the tray, said dish being characterized in that it has a pair of longitudinally extending, parallel runner portions integral with, and extending downwardly from said generally flat bottom surface, each of said pair of runner portions having end portions and an intermediate portion and having its maximum vertical extent at said end portions thereof, thereby defining a pair of foot portions for said dish, the said intermediate portion, which comprises the major portion of the length of each of said runner portions between said pair of foot portions, being of lesser vertical extent, said major portion of the length of said runner portions being at least equal in length to the longitudinal extent of an upper surface of said generally horizontally extending cantilevered support portion of a heater shelf with which the dish is adapted to be used, and which one of the runners of said dish is adapted to overlie when the dish is being heated.

4,560,860
HEATABLE ROLL

Hans Fauser, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 683,151
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400087
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—470 **9 Claims**

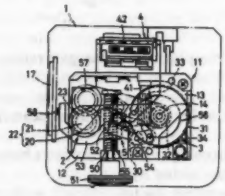


1. A heatable roll of the kind comprising a tubular, rotatable roll body, a plurality of heating elements distributed internally along the length of the roll, a stationary heating-energy source located externally of the roll body, a main lead disposed in the rotating roll body to which the said heating-energy source is connected via a connecting device, a heating output setting device for each heating element rigidly fixed to the rotating roll body and connected to the main lead, for setting the heating output dependent upon the magnitude of an electrical control signal, and a signal transmitting arrangement to which the heating output setting device are connected, for transmitting the control signals from a control centre located externally of the roll body to the rotating roll body, characterised in that the signal transmitting arrangement comprises at least one serial signal channel, a parallel-serial converter outside the roll body, via which said serial signal channel is connected to said control centre, and a serial-parallel converter inside the roll body, via which said serial signal channel is connected to the heating output setting device.

4,560,861
CONDITION REGULATING DEVICE FOR THE METERS FOR MEASURING THE QUANTITY OF MOTION

Yasuji Kato; Hiroyuki Kobayashi, both of Kanagawa, and Yukio Yamamoto, Tokyo, all of Japan, assignors to Yamasa Tokei Meter Co., Ltd., Japan

Filed Sep. 25, 1984, Ser. No. 654,230
Claims priority, application Japan, Mar. 15, 1984, 59-37151[U]
Int. Cl.⁴ G01C *22/00*
U.S. Cl. 235—105 **1 Claim**



1. In a meter for measuring the quantity of motion of a

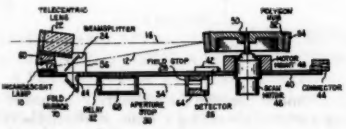
pedestrian and adapted to be worn thereby, which comprises sensor means including a pendulum for sensing vibrations, display means for displaying the swinging of said pendulum as a function of motion, and transmission means for transmitting the swinging of said pendulum to said display means, the improvement comprising a fixed upper limit stopper for said pendulum, an adjustable lower limit stopper for said pendulum, and a buffer assembly, said buffer assembly comprising an externally threaded regulating shaft rotatably supported at both ends on a fixed support, a movable member in engagement with the external thread of said shaft and adapted to reciprocate axially responsive to the rotation of said shaft, said lower limit stopper being integral with said movable member, a buffer lever rotatably mounted on said fixed support and adapted, when the acceleration acting upon said pendulum exceeds a predetermined value, to buffer the swinging of said pendulum at one end of said buffer lever, and a loop-like spring having one end secured to said pendulum and the other end secured to the other end of said buffer lever.

4,560,862

SYSTEM FOR OPTICAL SCANNING OVER A LARGE DEPTH OF FIELD

Jay M. Eastman, Pittsford, and John A. Boles, Rochester, both of N.Y., assignors to Skan-A-Matic Corp., Elbridge, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,885
Int. Cl.⁴ G06K 7/10
U.S. Cl. 235—467 **23 Claims**



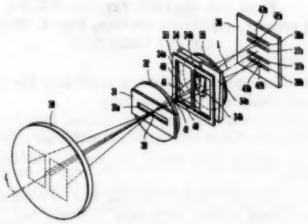
1. Scanning apparatus having a scanning range with a large depth of field which comprises optical means for providing a plurality of focal planes spaced from each other to define said depth of field, means for scanning a beam of illumination across said focal planes, and means for successively multiplexing said focal planes one at a time.

4,560,863

FOCUS DETECTING DEVICE

Susumu Matsumura; Takashi Suzuki, and Kenji Suzuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1983, Ser. No. 527,210
Claims priority, application Japan, Aug. 30, 1982, 57-150520
Int. Cl.⁴ G01J 1/20
U.S. Cl. 250—201 **10 Claims**



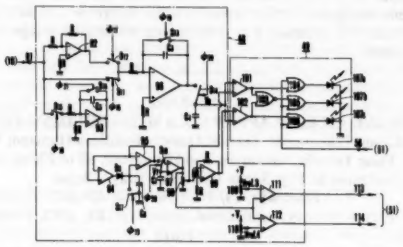
1. A focus detecting device comprising:
(a) an objective lens;
(b) imaging means which re-images an object's image formed on a prescribed image plane of the objective lens into a plurality of secondary images of the object by splitting a light flux from the objective lens symmetrically relative to the optical axis of the objective lens;
(c) light splitting means for splitting the light flux guided from said objective lens to said imaging means into a light flux portion from the neighbourhood of the optical axis of the objective lens and a light flux portion from outer parts of the objective lens; and
(d) light receiving means for detecting relative positional relation of said plurality of secondary images of the object re-imaged by said imaging means.

4,560,864

FOCUS DETECTING DEVICE

Takao Kinoshita, Tokyo; Takashi Kawabata, Kanagawa; Kazuya Hosoe, Tokyo; Tokuichi Tsunekawa, and Toshio Sakane, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 531,601, Sep. 12, 1983, abandoned, which is a continuation of Ser. No. 59,635, Jul. 23, 1979, Pat. No. 4,470,676. This application Apr. 29, 1985, Ser. No. 727,194
Claims priority, application Japan, Jul. 28, 1978, 53-92099; Dec. 4, 1978, 53-150378
Int. Cl.⁴ G01J 1/20
U.S. Cl. 250—201 **3 Claims**



1. A system for detecting focusing conditions of image forming optical means relative to an object, comprising:
(a) sensing means for producing a plurality of signal according to the change of a focusing condition of an object image formed by said optical means including a plurality of sensing elements producing signals according to the received radiation;
(b) discrimination means for discerning the focusing conditions of the image according to a plurality of signals produced by said sensing means, said discrimination means being arranged for producing a first signal for indicating the focusing condition;
(c) signal forming means for detecting the difference between the outputs of two sensing elements in a predetermined relation and adding the difference between the outputs obtained in a predetermined relation, said signal forming means being arranged for producing a second signal according to the result of the addition;
(d) comparison means for producing a third signal when a predetermined relation is reached between the second signal and the first signal by comparing the second signal with the first signal;
(e) indication means for indicating the focusing condition of the object image formed by said optical means in response to the first signal from said discrimination means, said indication means being arranged for indicating that said discrimination means is in the state in which it cannot discern the focusing condition of the object image when said comparison means produces the third signal; and
(f) control means for controlling transmission of the first signal from said discrimination means to said indication means, said control means being arranged to prohibit the transmission of

the first signal from said discrimination means to said indication means before the second signal is transmitted from said signal forming means to said comparison means.

4,560,865

OBJECTIVES PARTICULARLY FOR TELEVISION CAMERAS

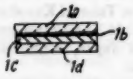
Arne Bergström, Angsövägen 7, 180 10 Enebyberg, Sweden

Filed Feb. 28, 1983, Ser. No. 470,385

Claims priority, application United Kingdom, Feb. 27, 1982, 8205838

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **11 Claims**



1. An objective comprising an opaque plate having front and back faces, a pinhole aperture in the plate through which light can pass, and an image intensifier having an input and an output, said intensifier being arranged in spaced disposition relative to the plate with said input facing said back face, and said pinhole aperture being arranged to produce an image at said input of a field of vision in front of the aperture, without any lens interposed between said pinhole aperture and said input, thereby to produce a corresponding intensified image at said output.

4,560,866

IMAGE PICK-UP APPARATUS WITH FOLDING OPTICS

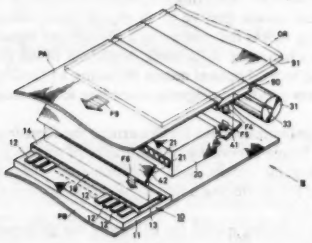
Mutsuo Takenouchi; Takashi Ozawa; Toshihisa Hamano; Mario Fuse; Takeshi Nakamura, and Hisao Itoh, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,347

Claims priority, application Japan, Apr. 23, 1982, 57-68498

Int. Cl.⁴ H01J *3/14*

U.S. Cl. 250—216 **16 Claims**



1. An image pick-up apparatus of the type having:

a transversely elongated photo sensor whose width corresponds to that of an original manuscript, said photo sensor including an array of photoelectric converting elements for performing photoelectric conversion in response to light signals incident thereto; and

a light source for emitting light beam toward an original surface, the improvement comprising:

first light beam direction changing means for directing a light beam reflected from the original surface to a direction substantially parallel with said original surface; and

first optical means having an outer shape of a rectangular solid, the width thereof corresponding to that of the original manuscript, the height thereof being sufficiently shorter than depth thereof, said depth being the length of the rectangular solid with respect to the traveling direction of the light beam, said first optical means being so disposed that the face thereof having said width and depth is substantially in parallel with said original surface, said first optical means including a plurality of lens elements arranged in the direction of the width of the original surface, each of said lens elements individually leading the light beam passed through said first light beam direction changing means toward the corresponding photoelectric converting elements so that one line of picture elements is transmitted onto said elongated photo sensor without being enlarged or reduced.

4,560,867

INTERFEROMETER DEVICE FOR MEASUREMENT OF MAGNETIC FIELDS AND ELECTRIC CURRENT PICKUP COMPRISING A DEVICE OF THIS KIND

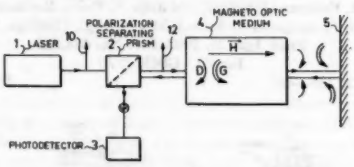
Michel Papuchon; Hervé Arditty, and Claude Puech, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 424,761, Sep. 27, 1982, abandoned. This application May 14, 1985, Ser. No. 734,246

Claims priority, application France, Nov. 3, 1981, 81 20594

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 250—225 **11 Claims**



1. Interferometer device for measuring magnetic fields, comprising a source providing a beam of rectilinearly polarized light in a path along a predetermined propagation direction, a propagation medium positioned along the path of this beam, a polarization separator element situated between said source and said medium, a detector device coupled to said polarization separator element, wherein the propagation medium is a magnetooptical medium subject to a non-reciprocal phase displacement and a mirror is arranged at right angles to the direction of propagation along side an extremity of said medium opposite said separator, and wherein the magnetooptical medium has its own propagation modes polarized in right-hand and left-hand directions, said medium retaining a circular polarization.

4,560,868

FIBER OPTICAL LUMINESCENCE SENSOR FOR MEASURING MECHANICAL DISPLACEMENT

Torgny Brogardh; Bertil Hök, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jan. 31, 1983, Ser. No. 462,702

Claims priority, application Sweden, Feb. 2, 1982, 8200575

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 250—227 **14 Claims**

1. In a fiber optical measuring apparatus for measuring a mechanical displacement comprising,

optical fiber means having first, second and third ends,

a first source of incident radiation adjacent to said first end of said optical fiber means for feeding incident radiation therein,

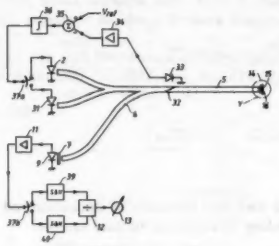
a sensor adjacent to said second end of said optical fiber means, said sensor including at least one luminescent element which will emit luminescent radiation when receiving said incident radiation via said optical fiber means,

radiation sensing means adjacent to said third end of said optical fiber means to receive luminescent radiation from said sensor via said optical fiber means and to generate an electrical output in response thereto, and

means for varying the amount of luminescent light transmitted by the fiber in response to said mechanical displacement,

the improvement wherein said measuring apparatus includes,

a second source of incident radiation adjacent to said first



end of said optical fiber means for feeding incident radiation therein, and

a spectral filter interposed between said second end of said optical fiber means and said at least one luminescent element, said spectral filter having different light transmission spectra to radiation emanating from said first and second sources of incident radiation.

4,560,869

METHOD AND APPARATUS FOR SCANNING RADIATED ENERGY USING A SINGLE MIRROR WITH A PLURALITY OF PIVOTAL POSITIONS

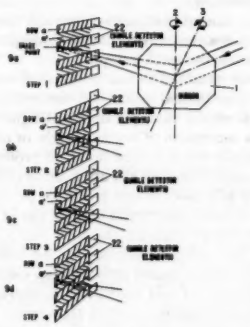
Rochus Hien, Speyer; Wolfgang Weigel, Dossenheim, and Horst Vierling, Heidelberg, all of Fed. Rep. of Germany, assignors to Eltro GmbH, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 398,833, Jul. 16, 1982. This application Feb. 15, 1985, Ser. No. 701,802

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128469

Int. Cl.[4] G02B *27/17*

U.S. Cl. 250—235 **19 Claims**



1. A method for scanning a radiant image, comprising the steps of:

(a) defining an image field by scanning a radiant image with a scanning mirror which reflects the radiant image onto a detector array composed of individual elements;

(b) generating with each of said individual elements a suitable electrical signal by performing an optoelectronic conversion;

(c) said scanning being performed by pivoting said mirror about a first axis on a first pivotal bearing device using a first drive to perform a horizontal scan having dead times while holding the scanning mirror with a given vertical orientation;

(d) using a second drive to scan vertical increments with a second pivotal bearing device rotating about a second axis, said second axis being different from said first axis to obtain a vertical displacement of the image field;

(e) said pivoting of the scanning mirror about the first pivotal bearing device occuring between the scanning of vertical increments to define several image fields;

(f) said scanning of vertical increments about the second pivotal bearing device occurring at such time period during which the scanning mirror is located at a position corresponding to said dead times of the horizontal scanning motion; and

(g) said scanning of vertical increments resulting in incrementing said scanning mirror among four vertical positions, each of said positions corresponding to one of four scanned fields, the first of said four positions corresponding to a field having an initial field position, the second of said four positions corresponding to a second field having a second field position, said second field position being displaced with respect to said first field position by a first vertical increment in a first direction, the third of said four positions corresponding to a third field position, said third field position being displaced with respect to said first field position by a second vertical increment in said first direction, said second vertical increment being half the magnitude of said first vertical increment, and the fourth of said four positions corresponding to a fourth field position, said fourth field position being displaced with respect to said first field position by a third vertical increment, in a second direction, said second direction being opposite said first direction and said third vertical increment having the same magnitude as said second vertical increment.

4,560,870

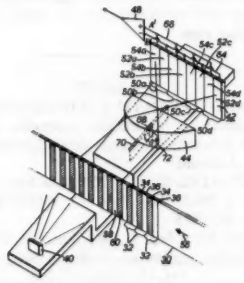
GRATICULE SENSOR HAVING A PLURALITY OF LIGHT DETECTORS

Krishnamurti Ramamurti, Wilmette, Ill., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 22, 1983, Ser. No. 525,244

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—237 G **9 Claims**



1. A graticule sensor comprising:

(a) a light source;

(b) more than two light detectors;

(c) a lens for focusing a shadow upon said light detectors which is formed by illumination of said graticule with said light source; and

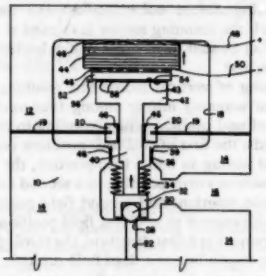
(d) means for comparing the outputs of the sum of alternate ones of said light detectors with the sum of the remaining ones of said light detectors to provide a signal indicative of relative motion between said graticule and said light detectors.

4,560,871

ACTUATOR FOR CONTROL VALVES AND RELATED SYSTEMS

Ronald R. Bowman, Boulder Heights, and Ingvar E. Sodal, Boulder, both of Colo., assignors to Marquest Medical Products, Inc., Englewood, Colo.

Filed Dec. 22, 1983, Ser. No. 564,415
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—288 **19 Claims**



1. A method for controlling the operation of a workpiece, comprising:

delivering a force to a force transfer element;

transferring at least a portion of said force to viscous means using said force transfer element;

rigidly coupling at least a portion of said force to a force receiving element using said viscous means;

causing said force receving element to react when at least a portion of said force is received by said force receiving element;

transferring at least a portion of said force from said force receiving element to a workpiece;

controlling the operation of said workpiece using the reaction of said force receiving element;

decoupling using said viscous means one of said force transfer element and said force receiving element when an unwanted force is applied to one of said force transfer element and said force receiving element; and

maintaining said workpiece in the same state during said decoupling step.

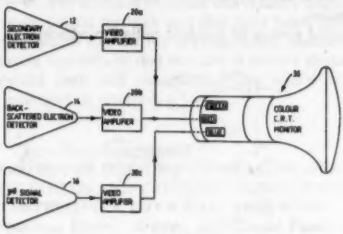
4,560,872

METHOD AND APPARATUS FOR IMAGE FORMATION

Ariel D. Antonovsky, Moorabbin, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

PCT No. PCT/AU82/00147, § 371 Date May 2, 1983, § 102(e) Date May 2, 1983, PCT Pub. No. WO83/00921, PCT Pub. Date Mar. 17, 1983
PCT Filed Sep. 1, 1982, Ser. No. 491,960
Claims priority, application Australia, Sep. 1, 1981, PF0538
Int. Cl.[4] H01J *37/256*
U.S. Cl. 250—310 **10 Claims**

1. A method of image formation wherein a sample is scanned by use of a scanning electron microscope to cause an electron microscope to cause an electron beam to be incident on the sample, and three image signals are generated by respectively detecting the intensity of secondary electron emission in a first energy band resulting from said incidence, the intensity of secondary electron emission in a second energy band resulting from said incidence, and the intensity of back-scattered electrons resulting from said incidence, said image signals being used to form a colour image of said sample in which the relative intensities of three image colours at each location in the image are repesentative of the prevailing relationship between said intensity of secondary electron emission in a first energy band, said intensity of secondary electron emission in a second energy band and said intensity of backscattered electron, at a corresponding location on the said sample.

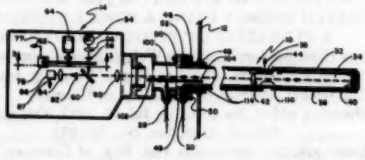


4,560,873

SITU MULTI-CHANNEL COMBUSTION GAS ANALYZER

Gerald F. McGowan, Parker; Gerald W. Price, Morrison; Carl E. Polhemus, Englewood, and Ronald L. Ketchum, Littleton, all of Colo., assignors to Lear Siegler, Inc., Englewood, Colo.

Filed Jun. 17, 1983, Ser. No. 505,201
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—339 **16 Claims**



1. Apparatus for measuring multiple component interfering gases contained in flue gases issuing from a stack due to combustion, comprising:

a probe for mounting to extend through the wall of a stack including a measurement cavity through which combustion gases in the stack can pass;

a transceiver mounted to said probe externally of said stack including an optical means and electric circuit means,

said optical means having a chopped light source for projecting a succession of beams of light of different selected wavelengths one at a time into said probe, a detector for continuously detecting any attenuation of each of the light beams by said gases in said probe for providing a measure of the extend of absorption of each gas of interset in each of a plurality of separate channels, and a zero absorption channel providing a reference for the other channels,

said electric circuit means providing an electric output representing each of said absorption measurements; and

control means coupled to said transceiver including first means for continuously converting said electric output to a corresponding percent modulation output for each of said gases of interest, for continuously correcting each of said percent modulation outputs for temperature, of correcting each of said percent modulation outputs for pressure, for correcting said percent modulation output for interference between measured gases, and to provide corrected continuous outputs representing the concentration of each of said measured gases,

said control means including automatic calibration means for continuously purging said measurement with dry air to provide zero values that are used in calculating said percent modulation and means to couple a gas valve into said

measurement cavity for the purpose of obtaining a gain factor for continuously correcting the measured results.

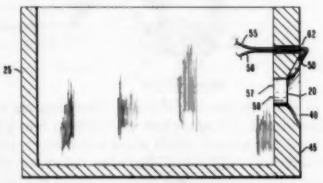
4,560,874
REFERENCE CHANNEL FOR SENSING OPTICAL CONTAMINATION

Robert J. Cinzori, Santa Barbara, and Mark T. Kern, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 269,210, Jun. 2, 1981, abandoned. This application May 29, 1984, Ser. No. 614,716

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 250—339 **4 Claims**



1. An improved fire sensor system, including a built-in detector window contamination sensing apparatus, said system comprising:

(a) a long-wavelength infrared radiation detector for detecting electromagnetic radiation in the spectral region of long-wavelength infrared and providing a detector output signal representative thereof;

(b) an outermost optical surface associated with said long-wavelength detector, said outermost optical surface being subject to obscuration by airborne contaminants;

(c) a reference channel, located adjacent to said long-wavelength detector, said reference channel including:

a reference source of electromagnetic radiation having a wavelength shorter than the wavelengths in said long-wavelength infrared spectral region,

a reference electromagnetic radiation detector for detecting electromagnetic radiation emitted by said reference source,

an outermost optical surface associated with said reference detector, said outermost optical surface being subject to obscuration by airborne contaminants,

said reference source located in close proximity to and within the field of view of said reference detector,

said reference source positioned to direct its electromagnetic radiation substantially towards said reference detector,

said reference source located external to the outermost optical surface of said reference detector,

a test circuit for providing an indicator output signal when less than a predetermined amount of electromagnetic radiation is detected by said reference detector;

whereby said reference source is calibrated to cause said test circuit to provide an indicator output signal when a predetermined degree of contamination is obscuring said reference detector corresponding to similar contamination of the outermost optical surface of said long-wavelength infrared detector.

4,560,875
INFRARED ABSORPTION GAS DETECTOR

John G. Crowder, Edinburgh, Scotland, assignor to EIGD Limited, Wetherby, United Kingdom

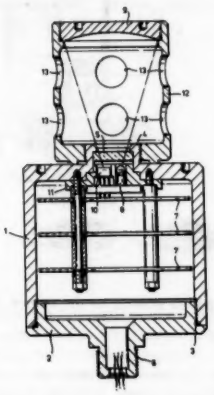
Filed Apr. 3, 1984, Ser. No. 596,349

Claims priority, application United Kingdom, Apr. 5, 1983, 8309211

Int. Cl.⁴ G01J *1/00, 1/42*

U.S. Cl. 250—343 **18 Claims**

1. In a monitoring head for an infrared absorption gas detector including a source (8) of infrared radiation, two detectors (17, 18) for detecting infrared radiation, a gas sample volume, an optical path extending between said source and said detectors and passing through said gas sample volume, and a selectively transmitting spectral filter (20, 21) located in said optical path leading to at least one of said detectors, the improvement wherein said two detectors are two elements of a dual element detector and both of said elements are identically formed, closely proximate each other, on a common substrate, wherein said filter is located immediately in front of one of said dual



elements of said detector, and wherein said optical path includes converging means (9) to provide overlapping and converging beams of radiation individually concentrated on said both elements of said dual element detector; the location of said gas sample volume, the separation of said two elements of said dual element detector, and said converging means being arranged such that infrared radiation emitted by said source and impinging on each of said elements of said dual element detector follows a substantially common path through said gas sample volume.

4,560,876
DETECTOR HEAD MOUNTING APPARATUS

Raymond L. Meeder, Palos Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Continuation of Ser. No. 298,635, Sep. 2, 1981, Pat. No. 4,438,335. This application Oct. 7, 1983, Ser. No. 540,087

The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

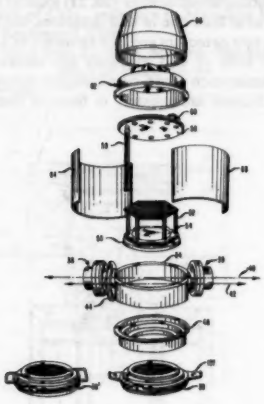
Int. Cl.⁴ G01T *1/20*; G21K *1/02*

U.S. Cl. 250—363 S **5 Claims**

1. Apparatus for pivotally mounting a detector head including a collimator onto supporting structure of a radiation detector comprising

means for mounting the head onto the supporting structure for rotation about a selected one of a first trunnion axis and a second trunnion axis, and

means for selecting the axis about which the detector head can rotate whereby the head will be rotatable about the



axis which passes nearest to the center of gravity of the head.

4,560,877

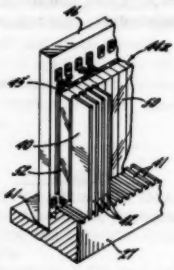
SOLID STATE DETECTOR MODULE

David M. Hoffman, New Berlin, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1982, Ser. No. 454,200

Int. Cl.⁴ G01T *1/202*

U.S. Cl. 250—366 **9 Claims**



1. A scintillator/diode module for use in a solid state x-ray detector comprising, in combination, a diode module having a plurality of individual diodes, a similar plurality of scintillators, each scintillator comprising a crystal having an index of refraction which differs as a function of direction through the crystal lattice, the lowest index direction being parallel to the cleavage plane, each scintillator having a front face for receiving x-rays, a rear face for coupling with a diode, and juxtaposed sides, each scintillator being oriented such that the cleavage plane thereof conforms to the sides, and means for causing each scintillator to serve as a light pipe from front to rear including polished sides on each scintillator, coating means on the sides for minimizing crosstalk between scintillators, said plurality of scintillators being joined at the sides for forming a scintillator module, and optical coupling means joining the scintillator module to the diode module with the scintillators in registration with the respective diodes.

4,560,878

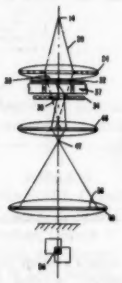
ELECTRON AND ION BEAM-SHAPING APPARATUS

Wolfgang Knauer, Malibu, and Walter E. Perkins, Jr., Redding, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 440,481, Nov. 9, 1982, abandoned, which is a continuation of Ser. No. 151,030, May 19, 1980, abandoned. This application Aug. 22, 1983, Ser. No. 525,199

Int. Cl.⁴ H01J *37/302, 37/147*

U.S. Cl. 250—396 R **15 Claims**



1. A beam-shaping apparatus for shaping an electron or ion beam and directing it onto a target plane, comprising:

a beam source for producing a substantially collimated electron or ion beam substantially along a center line,

first and second closely spaced plates positioned along the center line, the plates including mutually aligned shaped apertures for shaping a beam passing through the apertures,

a final lens positioned along the center line between the plates and the target plane, the final lens being adapted to focus an incident beam onto the target plane,

beam projection means responsive to a beam from the beam source for projecting the beam onto the final lens through the plate apertures, and

first and second deflection means positioned between the plates for deflecting the beam so that the beam passing out of the second aperture is shaped by the edges of the first and second apertures, the first and second deflection means being mutually spaced in the direction of the center line, the first deflection means imparting an initial deflection to the beam and the second deflection means directing the beam substantially back to the center line at the final lens to substantially eliminate vignetting and beam aberration due to the beam being projected onto the final lens off-center.

4,560,879

METHOD AND APPARATUS FOR IMPLANTATION OF DOUBLY-CHARGED IONS

Chung P. Wu, Hamilton Township, Mercer County, and Frank Kolondra, Delaware Township, Hunterdon County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 16, 1983, Ser. No. 532,899

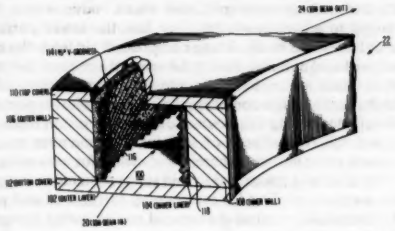
Int. Cl.⁴ G21K *5/00*

U.S. Cl. 250—492.2 **15 Claims**

1. In a vacuum ion implantation system for irradiation of a device comprising ion source means for providing a beam of ions comprising doubly charged ions, arcuate shaped magnetic analyzer means for selecting ions of predetermined mass to form said beam, said magnetic analyzer means including a hollow magnetic chamber having an inner wall, an outer wall and a top wall and a bottom wall defining an arcuate passageway through which said ion beam passes, the arc of said analy-

zer means defining the travel plane of said ion beam, optical means, including an ion acceleration column, for forming and focusing said beam, and ion scanning means for scanning said beam over the device, wherein the improvement comprises:

a liner formed of graphite or beryllium positioned on said



outer arcuate wall, said liner having grooves in said wall facing said passageway and shaped to scatter said secondary electrons into a plane that is tilted away from the plane of the ion beam, whereby secondary electrons generated by said ion beam impacting said outer wall liner are scattered away from said ion beam.

4,560,880

APPARATUS FOR POSITIONING A WORKPIECE IN A LOCALIZED VACUUM PROCESSING SYSTEM

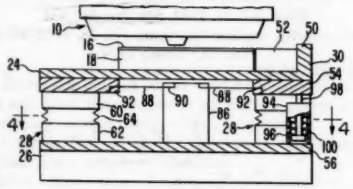
Paul F. Petric, Swampscott; Michael S. Foley, Beverly; John J. Waz, Ipswich, and Robert W. Milgate, III, Marblehead, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 19, 1983, Ser. No. 533,823

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.⁴ H01J *37/18, 37/20, 33/02*

U.S. Cl. 250—441.1 **20 Claims**



1. In a localized vacuum processing system, apparatus for positioning a workpiece with respect to a localized vacuum envelope so as to maintain a prescribed gap between said vacuum envelope and said workpiece as said workpiece is translated laterally with respect to a z-axis of said vacuum envelope, said apparatus comprising:

an x-y table adapted for x-y movement in a plane perpendicular to said z-axis;

a stage assembly movable along the z-axis with respect to said x-y table, said stage assembly including means for retaining said workpiece in a processing position;

a z-axis actuator assembly including

a plurality of expandible, fluid-containing members coupled between said x-y table and said stage assembly and operative to expand and contract along said z-axis in response to variations in the volume of fluid contained therein and

means for varying the fluid volume in each of said fluid-containing members in response to an actuator control signal so as to move said stage assembly along said z-axis; and

means for sensing the gap between said workpiece and said vacuum envelope and for providing said actuator control signal which maintains the dimension of said gap within a prescribed range.

4,560,881

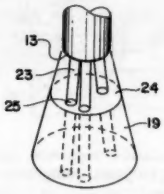
METHOD AND APPARATUS FOR ENHANCED DETECTION OF ELECTROMAGNETIC SIGNALS

Jonathan Briggs, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 13, 1984, Ser. No. 589,183

Int. Cl.⁴ F21V *9/16*

U.S. Cl. 250—458.1 **30 Claims**



1. A method of detecting fluctuations in an electromagnetic signal emitted by a receiver of incident electromagnetic radiation in response thereto, said receiver suspected of containing an element to be detected and/or measured, which comprises:

generating a beam of incident electromagnetic radiation having a spatial distribution of intensity periodically varying in time; irradiating at least a portion of said receiver with said beam; measuring the electromagnetic signal emitted by at least a portion of said irradiated receiver; and determining the correlation, if any, between the periodicity of said periodically varying spatial intensity distribution and fluctuations in said measured signal.

4,560,882

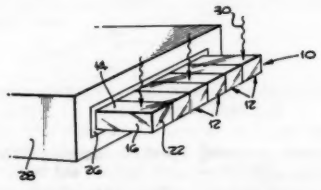
HIGH-EFFICIENCY X-RADIATION CONVERTERS

Zoran L. Barbaric, Malibu, and Robert S. Nelson, Santa Monica, both of Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Aug. 31, 1984, Ser. No. 645,855

Int. Cl.⁴ G01N *21/64*

U.S. Cl. 250—487.1 **20 Claims**



1. An apparatus for converting incident X-radiation to visible radiation comprising:

crystalline means for scintillating visible radiation in response to said incident X-radiation; and

reflection means, disposed exteriorly on a portion of said crystalline means, for internally reflecting said visible radiation within said crystalline means,

whereby said visible radiation is emitted by said apparatus from the portion of said crystalline means not having said exteriorly disposed reflection means.

4,560,883

METHOD OF AND DEVICE FOR ULTRAVIOLET IRRADIATION

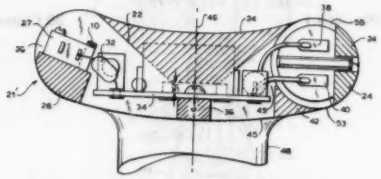
Johann J. Kerschgens, Arabellastrasse 5/1815, D-8000 Muenchen 81, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,662

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232537; Dec. 9, 1982, 3245655; Dec. 9, 1982, 3245654

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—504 R **23 Claims**



1. A portable irradiation apparatus, particularly for therapeutic and cosmetic purposes, comprising a box-shaped housing having a major wall formed with an outlet opening and an opposite major wall formed with an inlet opening, a reflector mounted in said outlet opening, a circuit board attached to said housing between the bottom of said reflector and said inlet opening for supporting a UV-lamp and power supply circuit for the UV-lamp, the power supply circuit including at least one capacitor, and a slip on air duct means communicating with the inlet of the housing and being attachable to an air blower to introduce a circulating stream of cooling gas past the UV-lamp and the electrical components inclusive of said capacitor.

4,560,884

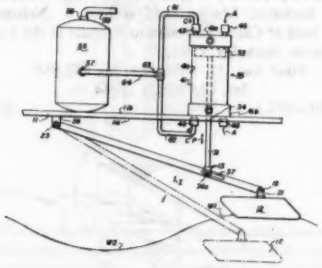
WAVE POWER ENERGIZER

William C. Whittecar, 3020 Crawford, Parsons, Kans. 67357

Filed Jul. 16, 1979, Ser. No. 57,730

Int. Cl.[4] F03B *13/12*

U.S. Cl. 290—42 **5 Claims**



1. A power generating apparatus comprising in combination, a stationary platform having an opening and supported over a body of water having a surface wave motion, at least one buoyant member floatingly supported on the surface of said body of water, a support member pivotally mounted at one end of the underside of said platform and connected at its other end to said buoyant member, a cylinder-piston assembly fixed in a stationary position on the upper side of said platform, said cylinder-piston assembly including a piston rod connected at its upper end to said piston and extending vertically downward through said cylinder and said opening in said platform, means for connecting the lower end of said piston rod to said support member intermediate the ends of said support member for vertical reciprocating movement of said piston and rod within said cylinder and for maintaining the axis of said rod in a vertically extending position during the pivotal movement of said buoyant member by said surface wave motion, inlet openings for atmospheric air adjacent the top and bottom of said cylinder, check valve means associated with each of said inlet and outlet opening, a compressed air storage reservoir, conduit means for communicating said outlet openings in said cylinder with said storage reservoir, said check valve means being arranged to admit atmospheric air into the lower portion of said cylinder and to discharge compressed air from the upper portion of said cylinder during the upward stroke of said piston and to admit atmospheric air into the upper portion of said cylinder to discharge compressed air from the lower portion of said cylinder during the downstroke of said piston during the rise and fall respectively of said buoyant member resulting from said wave motion, wherein said means for connecting the lower end of said piston rod to said support member comprises a lost motion coupling for maintaining the axis of said piston rod substantially vertical during said reciprocating movement and wherein said support member comprises a pair of arms arranged in spaced-apart parallel relationship and including a pair of spaced-apart bracket on the underside of said platform, a pin for pivotally connecting one end of each of said support arms to said platform brackets, a pair of spaced-apart brackets on said buoyant member, a pin for pivotally connecting the other end of each of said support arms to said buoyant member and wherein said means for connecting the lower end of said piston rod to said support member comprises a cross arm connected to the lower end of said piston rod and wherein the ends of said cross arm are connected to a respective one of said support arms by said lost motion coupling whereby motion of said buoyant member over a wide range is effected.

4,560,885

STEERING WHEEL SWITCHING CIRCUIT

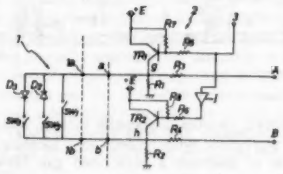
Hidehiko Naete, Yokohama; Chihiro Funaoka, Tokyo, both of Japan; Daniel Augello, La Celle Saint Cloud, and Jean-Claude Coste, Marly-le-Roi, both of France, assignors to Stanley Electric Co. Ltd., Tokyo, Japan and Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jul. 28, 1983, Ser. No. 517,954

Claims priority, application Japan, Jul. 28, 1982, 57-130542

Int. Cl.[4] H04Q *1/24*

U.S. Cl. 307—10 R **3 Claims**



1. A steering wheel switching circuit comprising:

a switching portion having three circuits connected in parallel across two terminals with a first one of said three circuits being a switch contact circuit, a second one of said three circuits being a series circuit including a first diode and a second switch contact circuit, and a third of said three circuits being a second series circuit including a second diode connected in a direction opposite the connection of said first diode and said second switch contact circuit; and

a controlling portion having a power supply and two series circuit with each series circuit including a switching element, a control terminal, and a load resistance which load resistance is connected to the ground of said power supply and whereby said two series circuits are connected in parallel with said power supply with said controlling portion further including two control output terminals connected across two connecting points with each of said

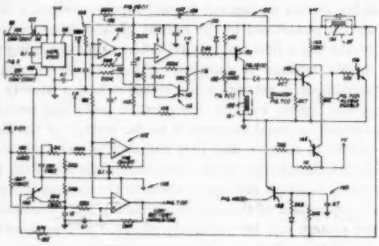
connecting points connecting one of said switching elements and one of said load resistances whereby a control signal applying means applies a control signal to the control terminal of said switching element of one of said two series circuits, and whereby, a means for inverting said control signals applies an inverted control signal to the control terminal of the switching element of the other of said two series circuits, and whereby said switching part is adapted to be fixed on a suitable position of a steering wheel, and two terminals of said switching portion are connected through coupling means to the control output terminals of said controlling portion which are adapted to be fixed on a car body, so that a plurality of component parts to be controlled which are installed on said car body can be controlled by outputs of said control output terminals with a combination of switching-on-and-off of switches in each said switch contact circuit of said switching circuit with variations of high and low levels of said control signals.

4,560,886

ALTERNATING CURRENT POWER SOURCE

Frank T. Ferguson, Oklahoma City, Okla., assignor to Control Technology, Inc., Oklahoma City, Okla.

Filed Dec. 22, 1983, Ser. No. 564,495
Int. Cl.[4] H02J *9/06*
U.S. Cl. 307—64 **30 Claims**



1. An alternating current power source connectible to a load between said load and an alternating current power supply, said alternating current power source comprising:

switch means for switchably connecting said alternating current power supply to said load;

line driver circuit means for providing an electrical output from which alternating current power is derived, said electrical output being connectible to said load, said line driver circuit means including:

output means for providing said electrical output to said load;

monitoring means for electrically monitoring said electrical output;

voltage reference means for providing an electrical voltage reference;

error adjustment means, responsive to said monitoring means and said electrical voltage reference, for providing a drive control signal; and

drive means, responsive to said drive control signal, for actuating said output means to provide said electrical output;

logic circuit means for detecting an interruption in the power provided by said alternating current power supply and for operating said switch means so that said load is electrically disconnected from said alternating current power supply when said interruption is detected and for enabling said line driver circuit means to provide said electrical output when said interruption is detected, said logic circuit means including:

means for providing an electrical signal related to the magnitude of a power signal provided by said alternating current power supply;

comparator means for comparing said electrical signal with a variable reference signal;

means, responsive to said comparator means, for providing said variable reference signal; and

switch operation means, responsive to said comparator means, for operating said switch means; and

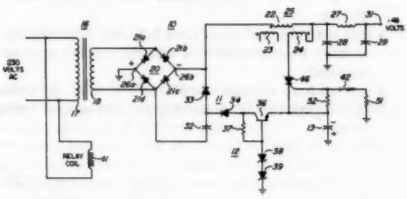
direct current power source means, responsive to said logic circuit means, for energizing said line driver circuit means so that said electrical output is provided when said interruption is detected.

4,560,887

STANDBY POWER SUPPLY

John C. Schneider, Ann Arbor, Mich., assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 22, 1983, Ser. No. 564,388
Int. Cl.[4] H02J *9/06*
U.S. Cl. 307—66 **7 Claims**



1. Means for supplying a load with a relatively short-term supply of direct current, said means characterized by:

input means for accepting AC power from an external supply;

rectifier means, responsive to said input means, for rectifying said AC power and transforming it into DC power at a first voltage magnitude;

a capacitance means for storing energy at a second voltage magnitude wherein said second voltage magnitude is greater than said first voltage magnitude;

a voltage multiplier means, responsive to said input means, for applying said second voltage magnitude across said capacitance means;

a transformer having at least a first winding for carrying current from said rectifier means, and a second winding or carrying current from said capacitance means; and

means for sensing the failure of said AC power and for connecting said capacitance means to said load, when said AC power fails.

4,560,888

HIGH-SPEED ECL SYNCHRONOUS LOGIC CIRCUIT WITH AN INPUT LOGIC CIRCUIT

Yoshio Oida, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 29, 1983, Ser. No. 518,454
Claims priority, application Japan, Aug. 3, 1982, 57-135401
Int. Cl.[4] H03K *3/289*
U.S. Cl. 307—272 A **2 Claims**

1. An ECL synchronous logic circuit comprising:

first and second voltage source terminals to receive first and second potentials:

first and second logic signal output terminals for outputting two logic signals of the opposite phases;

first and second bipolar transistors whose emitters are coupled to each other and whose bases receive first and second synchronizing signals of the opposite phases, respectively;

a first current source connected between the emitter node of

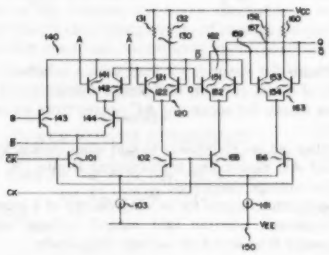
said first and second bipolar transistors and said first voltage source terminal;

an input logic circuit comprising third and fourth bipolar transistors whose emitters are coupled to each other and whose bases receive a first logic input signal and the inverted first logic input signal, respectively, and fifth and sixth bipolar transistors whose emitters are coupled to each other and whose bases receive a second logic input signal and the inverted second logic signal, respectively, the emitter node of said third and fourth bipolar transistors being connected to the collector of said first bipolar transistor, the emitter node of said fifth and sixth bipolar transistors being connected to the collector of said fourth bipolar transistor, and the collectors of said third and fifth bipolar transistors being coupled to each other;

a first signal holding circuit comprising seventh and eighth bipolar transistors whose emitters are coupled to each other and whose bases are connected to the collector of said sixth bipolar transistor and the collector node of said third and fifth bipolar transistors, the base and collector of said seventh bipolar transistor being coupled to the collector and base of said eighth bipolar transistors, respectively;

a first load element connected between the collector of said seventh bipolar transistor and the second voltage source terminal;

a second load element connected between the collector of said eighth bipolar transistor and the second voltage terminal;



ninth and tenth bipolar transistors whose emitters are coupled to each other and whose bases receive the second and first synchronizing signals, respectively;

a second current source connected between the emitter node of said ninth and tenth bipolar transistors and said first voltage source terminal;

a signal transfer circuit comprising eleventh and twelfth bipolar transistors whose emitters are coupled to each other, whose bases are connected to the collectors of said eighth and seventh bipolar transistors, respectively, and whose collectors are connected to said first and second logic signal output terminals, respectively, the emitter node of said eleventh and twelfth bipolar transistors being connected to the collector of said ninth bipolar transistor;

a second signal holding circuit comprising thirteenth and fourteenth bipolar transistors whose emitters are coupled to each other and whose bases are connected to the collectors of said eleventh and twelfth bipolar transistors, respectively, the emitter node of said thirteenth and fourteenth bipolar transistors being connected to the collector of said tenth bipolar transistor and the base and collector of said thirteenth bipolar transistor being connected to the collector and base of said fourteenth bipolar transistor, respectively;

a third load element connected between said first logic signal output terminal and said second voltage source terminal; and

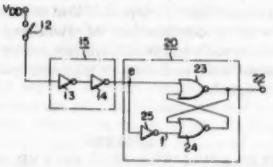
a fourth load element connected between said second logic signal output terminal and said second voltage source terminal.

4,560,889

AUTOMATIC CLEAR CIRCUIT

Yasunori Hayashi, Ebina, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1982, Ser. No. 361,087
Claims priority, application Japan, Apr. 24, 1981, 56-62228
Int. Cl.[4] H03K *17/22, 5/153*
U.S. Cl. 307—290 **1 Claim**



1. An autoclear circuit for producing reset signals to initialize the operation of a system, comprising:

a power supply to provide voltage to the system;

an input terminal connected to the power supply;

a delay circuit connected to said input terminal; a Schmitt circuit connected to the output of said delay circuit and producing a first reset signal when a quickly rising power supply voltage is supplied to said input terminal, and producing a second reset signal when a slowly rising power supply voltage is applied to said input terminal;

an output terminal connected to the output of the Schmitt circuit to receive said first and second reset signals produced, depending on the rise characteristics of the power supply voltage, and apply them to the system to initialize the operation of the system, whereby the initialization of the system can be positively effected irrespective of the rise characteristics of the power supply voltage,

said delay circuit being composed of at least one inverter, and

said Schmitt circuit being composed of a first NOR circuit having a first input connected to the output of said delay circuit and an output connected to said output terminal; an inverter having an input connected to the output of said delay circuit; and a second NOR circuit having a first input connected to the output of said inverter, a second input connected to the output of said first NOR circuit, and an output connected to a second input of said first NOR circuit.

4,560,890

AUTOZEROED COMPARATOR

Eiji Masuda, Kawasaki; Kenji Matsuo, Yokohama, and Yasuhiko Fujita, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

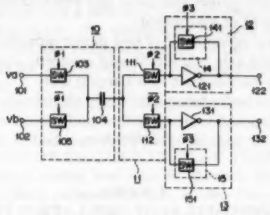
Filed Aug. 26, 1983, Ser. No. 526,821
Claims priority, application Japan, Aug. 31, 1982, 57-150983
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **6 Claims**

1. An autozeroed comparator comprising:

input voltage sampling means for alternately supplying two input voltages to be compared to one terminal of a capacitor so as to obtain a voltage difference between the two input voltages at the other terminal of said capacitor;

alternate switching means for switching an output from said input voltage sampling means at a period which is longer than at least twice a sampling period;

amplifying means for amplifying an output sequentially supplied from said alternate switching means; and

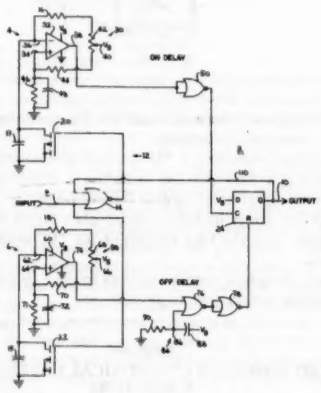


operating point setting means for setting an input level of said amplifying means at an operating point voltage.

4,560,891
ON/OFF DELAY CIRCUIT

Lawrence J. Ryczek, Nashotah, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 30, 1983, Ser. No. 509,950
Int. Cl.⁴ H03K *5/13*; H01M *47/18*
U.S. Cl. 307—597 **17 Claims**

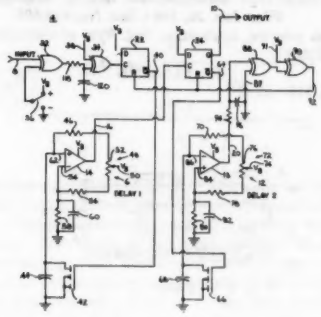


1. An ON/OFF delay circuit comprising:
first and second comparator timers responsive to an input signal and providing respective ON and OFF delays of an output signal; and
means for resetting said first and second comparator timers independently of each other such that each respective ON or OFF delay function may begin retiming without waiting for the other delay function if said input signal changes states before the end of the respective ON or OFF delay; wherein:
an input ON signal initiates ON delay,
if said input signal changes OFF before the end of said ON delay, said output remains OFF, and
when said input signal changes back ON, said ON delay begins retiming without waiting for the OFF delay;
an input OFF signal initiates OFF delay,
if said input signal changes ON before the end of said OFF delay, said output remains ON, and
when said input signal changes back OFF, said OFF delay begins retiming without waiting for the ON delay.

4,560,892
ONE-SHOT DELAY TIMER

Lawrence J. Ryczek, Nashotah, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 30, 1983, Ser. No. 509,949
Int. Cl.⁴ H03K *5/13*; H01M *47/18*
U.S. Cl. 307—597 **16 Claims**

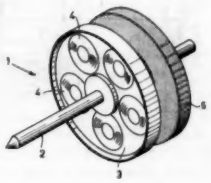


1. A one-shot delay timer comprising:
first delay means responsive to an input signal and initiating an output pulse after a given delay; and
second delay means terminating said output pulse after a given delay, to control the length of said output pulse;
wherein said delayed output pulse of controlled length is generated for each said input signal except when a second input signal occurs before the termination of said output pulse;
wherein said delayed output pulse is controlled length is generated regardless of the duration of said input signal, even if said input signal lasts longer than the termination of said output pulse;
and wherein:
said first delay means comprises a first comparator timer responsive to edge triggered timing initiation by said input signal and providing a delayed output initiating said output pulse; and
said second delay means comprises a second comparator timer providing a delayed output terminating said output pulse.

4,560,893
ELECTRIC MOTOR

Jan M. van de Griend, Doredrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,048
Claims priority, application Netherlands, Apr. 22, 1983, 8301417
Int. Cl.⁴ H02K *1/04*
U.S. Cl. 310—43 **1 Claim**



1. An electric motor comprising a rotor which has a disk-shaped carrier manufactured of a synthetic resin, said carrier comprising coils, means for increasing rotational inertia of said carrier, said means including lead oxide embedded in said

synthetic resin, said synthetic resin and lead oxide being injection molded surrounding said coils.

4,560,894

ELECTRIC LINEAR DRIVE WITH AN EXTERNAL ROTOR ELECTRIC MOTOR

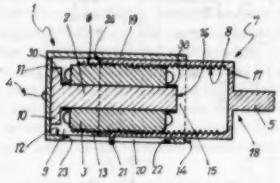
Kurt Stoll, D-7300, Esslingen, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,601

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325801

Int. Cl.⁴ H02K *7/00*

U.S. Cl. 310—67 R **11 Claims**



1. An electric linear drive comprising:

a housing;

a stator fixed to said housing and extending in said housing;

an external rotor mounted for rotation around said stator and axially fixed with respect to said stator, said rotor having a male thread defined on an external surface thereof;

a bush axially movable and rotationally fixed with respect to said housing, said bush having an interior space with a female thread defined thereon, said female thread engaged with said male thread so that rotation of said rotor causes linear axial motion of said bush; and

a thrust rod connected to said bush for movement in an axial direction with axial movement of said bush.

4,560,895

ELECTRIC MOTOR EQUIPPED WITH INNER BLOCKING BRAKE

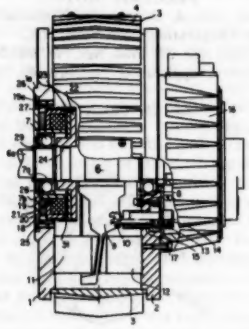
Pierre W. Zahner, Luins, Switzerland, assignor to Mavilor Systemes S.A., Switzerland

Filed Nov. 7, 1983, Ser. No. 549,590

Claims priority, application Switzerland, Nov. 9, 1982, 6493/82

Int. Cl.⁴ H02K *23/68*

U.S. Cl. 310—77 **8 Claims**



8. In an electric motor having a predefined axis of rotation and friction brake, the motor being constructed to have a magnetic field therein oriented at least partially axially, said motor comprising:

axially spaced, opposed flanges defining axial outer boundaries of a housing for said motor;

axially inwardly projecting magnets positioned on at least one of said flanges and about said axis to define a magnetic component of said motor;

an electrical component of said motor mounted for rotation about said axis relative to said magnetic component at a position intermediate said flanges; and

said friction brake being selectively electrically actuable and being disposed entirely within said motor housing essentially in an annular space circumscribed by the magnets.

4,560,896

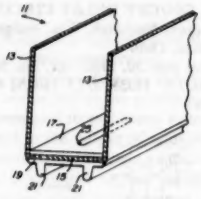
COMPOSITE SLOT INSULATION FOR DYNAMOELECTRIC MACHINE

George H. Vogt, Hendersonville, N.C., and Scott K. Derderian, Salem, Mass., assignors to General Electric Company, Lynn, Mass.

Filed Oct. 1, 1984, Ser. No. 656,571

Int. Cl.⁴ B32B *3/24;* **H02K** *3/34*

U.S. Cl. 310—215 **6 Claims**



1. A composite slot armor and sub-slot cover for a dynamoelectric machine comprising:

slot armor including a "U"-shaped aramid paper channel having a base portion including a plurality of axially spaced apart holes formed therethrough;

a sub-slot cover including epoxy-glass layers formed integrally with the base portion of the "U"-shaped channel; and,

axially elongated ventilation slots formed through the base portion and the epoxy-glass layers.

4,560,897

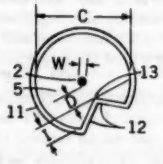
RIGID INDENTED CYLINDRICAL CATHODE FOR X-RAY TUBE

Claude R. Hudgens, Dayton, Ohio, assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 6, 1983, Ser. No. 501,312

Int. Cl.⁴ H01J *1/20*

U.S. Cl. 313—337 **12 Claims**



1. A replaceable cathode assembly for an X-ray vacuum tube, said assembly comprising:

a wire filament including a straight portion having a maximum cross-sectional diameter W;

a straight tubular cathode parallel to and surrounding only said straight portion of said filament, the normal inside

cross-sectional diameter C of said cathode being at least 10W; and

insulating means for rigidly fastening said filament with respect to said cathode, the minimum distance D between said filament and a first sector of said cathode being less than 0.35C-0.5W, the minmimum distance between said filament and the remaining sector of said cathode being too great for said filament to cause significant release of electrons.

4,560,898

COLOR PICTURE DISPLAY TUBE

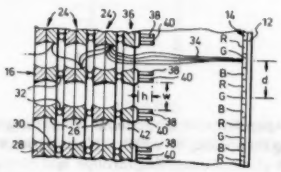
Alan G. Knapp, Crawley, and John R. Mansell, East Grinstead, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,889

Claims priority, application United Kingdom, Jun. 16, 1982, 8217410

Int. Cl.⁴ H01J *31/48*

U.S. Cl. 313—400 **8 Claims**



1. A color display tube comprising:

(a) a laminated dynode channel plate electron multiplier;

(b) means for producing an electron beam and scanning said beam across an input face of the electron multiplier;

(c) an apertured extractor electrode mounted on but electrically insulated from an output face of the electron multiplier, apertures in the extractor electrode communicating with respective channels in the electron multiplier;

(d) a luminescent screen spaced from an output face of the extractor electrode and comprising a repetitive pattern of groups of phosphor elements, the phosphor elements in each group adapted to luminesce in different colors; and

(e) pairs of first and second deflector electrodes mounted on the output face of the extractor electrode, each pair being disposed between adjacent apertures in the extractor electrode, the first and second deflector electrodes in each pair being electrically insulated from each other and from the extractor electrode, all of the first deflector electrodes being electrically connected to each other and all of the second deflector electrodes being electrically connected to each other, ones of the first and second deflector electrodes disposed on opposite sides of each aperture in the extractor electrode effecting deflection of electrons emerging from the aperture to a selected one of the phosphor elements in a group corresponding to said aperture when a respective predetermined potential difference is applied to said first and second deflector electrodes.

4,560,899

ELECTRON BEAM FOCUSING LENS

Shigehiko Takayama, Mitaka; Masanori Maruyama, Kokubunji, and Masakazu Fukushima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,198

Claims priority, application Japan, Dec. 16, 1981, 56-201614

Int. Cl.⁴ H01J *29/00, 31/26*

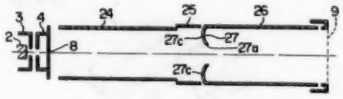
U.S. Cl. 313—449 **9 Claims**

1. An electron beam focusing lens for forming an electrostatic focusing field, comprising:

a first cylindrical electrode;

a second cylindrical electrode, an electric potential applied to said second cylindrical electrode being lower than an electric potential applied to said first cylindrical electrode; and

a plate electrode having an aperture therein and provided at an end face of said first cylindrical electrode opposite to said second cylindrical electrode said plate electrode having a circularly curved portion which is projected toward said second cylindrical electrode between the



outer circumference of said plate electrode and the inner circumference thereof defining said aperture, said aperture of said plate electrode having its diameter equal to or less than eight-tenths of the inner diameter of said first cylindrical electrode, and the maximum projection length of said curved portion of said plate electrode in a direction of the lens axis being equal to or less than one-half of a difference between the outer and inner circumference of said plate electrode in its radial direction.

4,560,900

CATHODE RAY TUBE DEVICE WITH ELECTROMAGNETIC SHIELD CASING

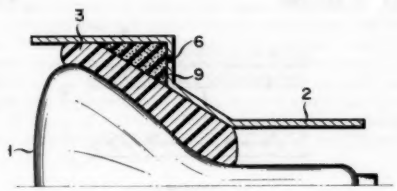
Makoto Ikegaki, Fukaya; Masayuki Nakanishi, Isezaki; Humiyuki Sato, and Tokuo Hashimoto, both of Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 2, 1982, Ser. No. 404,496

Claims priority, application Japan, Aug. 4, 1981, 56-115323[U]; Sep. 1, 1981, 56-128725[U]

Int. Cl.⁴ H01J *29/86*

U.S. Cl. 313—479 **7 Claims**



1. A cathode ray tube device which comprises:

an electromagnetic shielding casing;

a cathode ray tube held in said casing;

an elastic material which is provided between said casing and cathode ray tube in contact therewith; and

a porous material formed in part of a region defined solely between the casing and elastic material.

4,560,901

LIGHT-EMITTING DEVICE HAVING AT LEAST TWO SEMICONDUCTOR CRYSTALS

Jacques C. Thillays, Herouville St. Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,377

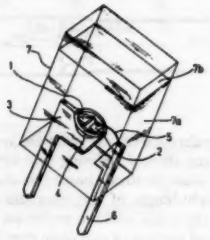
Claims priority, application France, Jan. 29, 1982, 82 01463

Int. Cl.⁴ H05B *33/02;* **H01L** *33/00*

U.S. Cl. 313—499 **5 Claims**

1. A light transmitter comprising at least two semiconductor crystals, in each of which an electroluminescent junction is formed between two regions of opposite conductivity types,

said crystals being accommodated in a transparent protective envelope which has a surface from which the radiation emitted by said junction emanates, which junctions can be alternately energized from an external current source through only output electrodes which are passed through said transparent envelope, said two crystals being secured on a single metal support on the bottom of a reflecting cavity, one of the crystals having a subjacent n-type region secured to said support and an upper



p-type region from which the light emanates, and the other crystal having a subjacent p-type region secured to said support and an upper n-type region from which the light emanates, said support comprising a portion of a first of said two electrodes with said subjacent regions of the crystals secured thereto, while a second of said two electrodes is connected to the upper regions of said two crystals, so that the two crystals are connected in parallel.

4,560,902

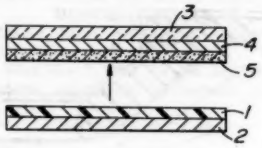
ADHESIVELY BONDED ELECTROLUMINESCENT SYSTEM

Donald R. Kardon, 134 N. Narberth Ave., Narberth, Pa. 19072

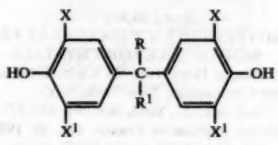
Filed Jul. 18, 1983, Ser. No. 514,517

Int. Cl.⁴ H05B *33/02*

U.S. Cl. 313—502 **4 Claims**



1. In an electroluminescent lamp comprised of mutually opposed electrodes, a dielectric and electroluminescent phosphor; the improvement which comprises utilizing as said dielectric a thermoplastic adhesive having a molecular weight of from about 450–75,000 and consisting essentially of a mixture of about 5–6 parts of an eqoxy resin and about 1 part of the reaction product of epihalohydrin and a bisphenol of the formula:



wherein R and R^1 are selected from the group consisting of hydrogen, lower alkyl and mononuclear aryl and X and X^1 are selected from the group consisting of hydrogen, halogen and lower alkyl.

4,560,903

HIGH PRESSURE DISCHARGE LAMP

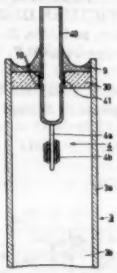
Andreas P. E. Sneijers; Jacobus M. M. Claassens, and Roger J. Q. Van den Plas, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,783

Claims priority, application Netherlands, Feb. 26, 1982, 8200783

Int. Cl.⁴ H01J *61/30, 61/36*

U.S. Cl. 313—625 **5 Claims**



1. A high-pressure discharge lamp comprising a discharge vessel having an opening in which a closing part is disposed, a lead-through element extending through said closing part, said discharge vessel enclosing a discharge base and being provided with a ceramic wall, said lamp including two main spaced apart electrodes, between which, in the operating condition of the lamp, a discharge takes place, at least one of said electrodes being connected to said lead-through element which is passed through said closing part, said lead-through element having at least a part thereof surrounded by said closing part with an intermediate space therebetween, said lead-through element being connected to said closing part by a sealing joint in a gas-tight manner, said sealing joint extending in said intermediate space, said lead-through element having a protuberance extending around the entire surface thereof, said protuberance cooperating with said closing part surrounding said lead-through element, said sealing joint extending in said intermediate space no closer to said discharge than said protuberance so that substantially all of said sealing joint is not exposed to the materials inside of said discharge space.

4,560,904

TRAVELING-WAVE TUBE WITH A PERIODIC PERMANENT-MAGNET FOCUSING SYSTEM

Roland Wolfram, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,523

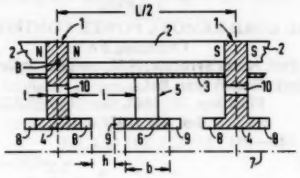
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248693

Int. Cl.⁴ H01J *25/34*

U.S. Cl. 315—3.5 **6 Claims**

1. A traveling-wave tube comprising: a cylindrical evacuated sheath, surrounded by a permanent-magnet system having pole shoes with magnet rings inserted between the pole shoes which are axially arranged with alternating opposite polarization while the pole shoes inserted in the evacuated sheath and the portion of them closest to the beam axis are shaped in the form of small tubes, every second pole shoe is coupled as an active pole shoe to the magnet rings, and the pole shoes that are located between the active pole shoes are attached to the evacuated sheath, said active pole shoes (1) are coupled to said magnet rings (2) and being made of magnetic metal at least end

portions (8) located at the extremities of the said small tubes (4) being made of non-magnetic metal while the small tubes are



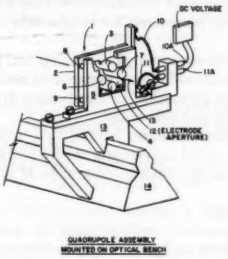
made of magnetic metal, and said pole shoes (5) located between said tubes (6) being made of non-magnetic metal.

4,560,905

ELECTROSTATIC QUADRUPOLE FOCUSED PARTICLE ACCELERATING ASSEMBLY WITH LAMINAR FLOW BEAM

Alfred W. Maschke, East Moriches, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,645
Int. Cl.[4] H01J *25/10*
U.S. Cl. 315—5.41 7 Claims



1. In a charged particle accelerating assembly having a plurality of electrostatic quadrupoles positioned in linearly spaced relationship to one another, with each of said quadrupoles having four electrodes that are operable to focus and accelerate charged particles into a beam that successively traverses the fields of each of the quadrupoles, the improvement comprising;

each of said quadrupoles having an effective beam-receiving aperture radius (r_Q), an electrode length (1_Q), an applied quadrupole voltage (E_Q), and

each of said quadrupoles being operable in combination with a particle beam having an energy V_n, and a beam radius (r_b) at the respective quadrupoles,

thereby to maintain a constant parametric ratio (K) that satisfies the equation:

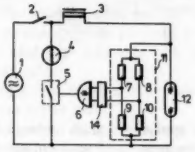
$$\frac{r_b^2}{r_Q^2}\ \frac{E_Q^2 l_Q^2}{r_Q^2 V^2} = K$$

4,560,906

LIGHTING SYSTEM AND COMPACT ELECTRIC LIGHTING UNIT

Béla Kerekes, Budapest, Hungary, assignor to Egyesult Izzolampa es Villamossagi RT., Budapest, Hungary

Continuation-in-part of Ser. No. 337,693, Jan. 7, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 623,626
Claims priority, application Hungary, Feb. 6, 1981, 288/81
Int. Cl.[4] H01J *7/44;* H01K *1/64*
U.S. Cl. 315—47 15 Claims



1. A lighting system comprising:

(a) a high pressure gas-discharge light source;

(b) terminals for connecting said high-pressure gas-discharge lamp to an A.C. source;

(c) an incandescent or a standby filament;

(d) a current-limiting impedance element coupling said high pressure gas discharge light source to said A.C. source;

(e) a controllable interrupter element coupling said incandescent filament to said A.C. source;

(f) a voltage divider system comprising first and second voltage dividers; each divider for generating a predetermined voltage responsive to the level of energizing said gas-discharge lamp source;

(g) control means for controlling said controllable interrupter element, said control means comprising an output terminal connected to said interrupter element,

and first and second input terminals connected to respective output terminals of said voltage dividers, wherein said output terminal is energized if both of said input terminals are similarly energized and said control means comprising first and second AND-gates, an OR-gate and two inverters connected between inputs of said first and second AND-gates, outputs of said first and second AND-gates connected to inputs of said OR-gate and input terminals of said control means are represented by inputs of said first AND-gate, while output terminal of said control means is represented by output of said OR-gate.

4,560,907

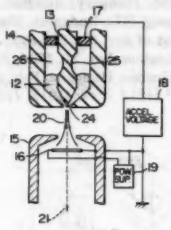
ION SOURCE

Hifumi Tamura, Hachioji; Hiroshi Okano, Tokyo; Tohru Ishitani, Sayama, and Akira Shimase, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,721
Claims priority, application Japan, Jun. 25, 1982, 57-108338
Int. Cl.[4] H01J *7/24;* H05B *31/26*
U.S. Cl. 315—111.01 14 Claims

1. An ion source apparatus in which an ion source material is heated for effecting surface ionization to extract an ion beam through a high strength electric field, the ion source apparatus comprising: an emitter tip in the form of a round rod having a sharp-pointed end; an ion source material holder for holding said emitter tip coaxially within a crucible made of a material of a high melting point, said crucible having an opening formed in a bottom wall thereof through which the sharp-pointed end of said emitter tip extends, said ion source material filling said crucible so as to enclose an outer periphery of said sharp-pointed end of said emitter tip; a filament disposed below the emitter tip for emitting electrons to bombard said emitter tip so as to heat said emitter tip as a result of the bombardment by the electrons; a heating power supply for heating said filament; an ion beam extracting electrode disposed between said

emitter tip and of said filament and maintained at substantially a same potential as said filament; and an accelerating voltage



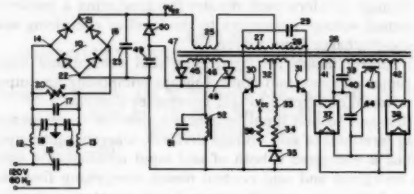
power supply for applying a high voltage between said ion beam extracting electrode and said emitter tip to accelerate said electrons and said ion beam.

4,560,908

HIGH-FREQUENCY OSCILLATOR-INVERTER BALLAST CIRCUIT FOR DISCHARGE LAMPS

Edward H. Stupp, Spring Valley; Mark W. Fellows, Monroe, and Walter G. Steneck, Ossining, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,734
Int. Cl.⁴ H05B *37/00*
U.S. Cl. 315—219 **16 Claims**



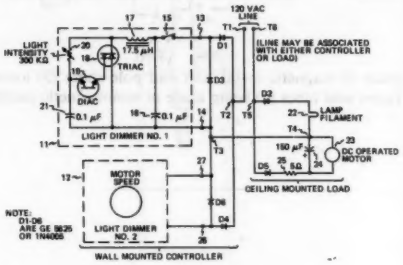
1. A high frequency oscillator-inverter for starting and operating at least one electric discharge lamp from a low frequency AC power source comprising, a pair of input terminals for connection to the AC power source, a rectifier circuit having an input coupled to the input terminals and an output for supplying a fluctuating DC voltage, an oscillator-inverter circuit including at least one transistor, a ballast coupling circuit for coupling the output voltage of the oscillator-inverter circuit to at least one said discharge lamp, said ballast circuit including a transformer having a primary winding coupled to said one transistor and a secondary winding coupled to said one discharge lamp, a capacitor coupled to the transformer primary winding to form a parallel resonant circuit for the oscillator-inverter circuit which exhibits a high oscillation operating frequency relative to said low frequency AC power source, means coupling the output of the rectifier circuit to said oscillator-inverter circuit to produce oscillation at said operating frequency, a regenerative power supply including means for switching said regenerative power supply into and out of circuit with the oscillator-inverter circuit as a function of a given voltage threshold level determined by the AC power source, thereby to produce a substantial change in the oscillation frequency of the oscillator-inverter circuit and in a sense that tends to maintain the lamp current constant in the operating condition of the lamp, and a frequency dependent impedance element whose electric impedance varies as a function of frequency and connected in series with said one discharge lamp across said transformer secondary winding and with its impedance being variable with said change in oscillation frequency in a sense to maintain the flow of lamp current within given limits.

4,560,909

DUAL LOAD REMOTE POWER CONTROL FOR A CEILING FAN

William Peil, North Syracuse, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 28, 1982, Ser. No. 425,522
Int. Cl.⁴ G05F *1/00*
U.S. Cl. 315—291 **7 Claims**



1. A power control combination for use in a system for independently remotely controlling a fan motor load and a lighting load from a common ac source having a substantially sinusoidal waveform, comprising:

A. a double load circuit having two connection nodes, comprising:

(1) the fan motor and lighting loads, each having two terminals,

(2) a first diode serially connecting said lighting load between the load circuit connection nodes, said first diode being connected for conduction in a first sense, and

(3) a second diode serially connecting said fan motor load between said load circuit connection nodes, said second diode being connected for conduction in a second sense opposite to said first sense,

B. a power control circuit having two connection nodes adapted for serial connection with the two connection nodes of the load circuit to a common ac source, comprising:

(1) a first and a second two-terminal, semiconductor power controller, each adapted for serial connection with a remote load to a source, and having an adjustable duty cycle when half-waves of a substantially sinusoidal power waveform are applied,

(2) a third diode serially connected with said first controller between said two control circuit connection nodes, said first diode being connected for conduction in said first sense for simultaneous conduction of said first controller with said first load for positive halfwaves, and

(3) a fourth diode serially connected with said second controller between said control circuit connection nodes, said second diode being connected for conduction in said second sense for simultaneous conduction of said second controller with said second load, for negative halfwaves,

whereby upon association of an ac main with one of said circuits, said serial interconnection may be achieved by a two conductor cable;

C. (1) a fifth diode connected between the two terminals of said first controller, (2) a sixth diode connected between the two terminals of the second controller,

said fifth and sixth diodes being poled to preclude significant voltage inversion across the associated controller terminals for isolation between the individual controllers, and operating to

inhibit current conduction through their associated controllers for more than a half of each wave of applied power; and

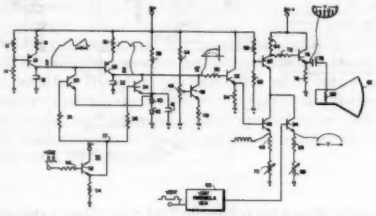
D. a capacitor connected in shunt with the motor terminals for smoothing the voltage applied to the motor.

4,560,910

PARABOLIC WAVEFORM GENERATOR

Richard W. Midland, Inverness, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 19, 1984, Ser. No. 572,104
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **10 Claims**



1. A DC coupled parabolic voltage generator for use in a dynamic focussing system for a CRT comprising:

first means including a current source transistor for supplying a substantially constant charging current to a first capacitor for developing a sawtooth voltage;

second means including a voltage-to-current generator transistor for supplying a sawtooth shaped charging current to a second capacitor for developing a parabolic voltage in response to said sawtooth voltage; and

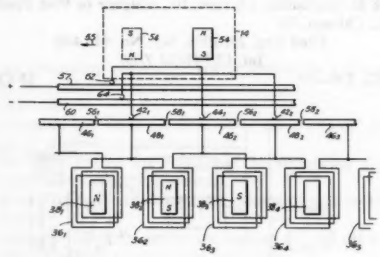
means comprising transistor switches coupled across said first and said second capacitors for controlling the charging time of both said first and said second capacitors as a function of a common timing signal.

4,560,911

POSITIONING TABLE AND LINEAR MOTOR

Anwar Chitayat, Northport, N.Y., assignor to Anorad Corporation, Hauppauge, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,351
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **5 Claims**



1. A positioning table and linear motor, comprising:

a U-shaped frame of said positioning table, said U-shaped frame having first and second substantially parallel arms;

first and second opposed guides in said first and second substantially parallel arms;

a table having first and second substantially parallel sides, a top surface and a bottom surface;

guide means in said first and second substantially parallel sides for engaging said first and second opposed guides and for constraining said table for substantially linear movement along a linear axis parallel to said first and second substantially parallel sides;

a U-shaped metallic motor frame affixed in a bottom surface of said U-shaped frame of said positioning table substantially parallel to said linear axis, an opening of said U-shaped metallic motor frame facing said bottom surface;

first and second substantially parallel arms of said U-shaped metallic motor frame extending close to, but not touching, said bottom surface;

at least one coil having a core therein affixed in said U-shaped metallic motor frame, said at least one coil being effective when energized to produce a first magnetic pole in said core, said first magnetic pole facing said bottom surface of said table;

said core having a first substantially plane surface generally parallel to said linear axis;

at least one permanent magnet having a second magnetic pole, said at least one permanent magnet being affixed to said bottom surface of said table with said second magnetic pole facing said first substantially plane surface;

said at least one permanent magnet having a second substantially plane surface disposed generally parallel to said first substantially plane surface;

a linear slip ring assembly affixed to an inside surface of said U-shaped metallic motor frame;

said linear slip ring assembly defining a plane and having a plurality of metallic areas electrically separated from each other and forming a line substantially parallel to said linear axis;

a brush assembly affixed to said table and having spaced apart contact members slidably contacting said plurality of metallic areas at contact points; and

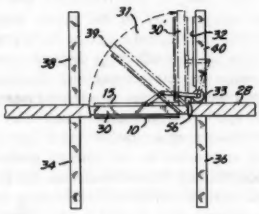
means for feeding electrical power through said contact points to said at least one coil in a sense which is effective to magnetize said core with said first magnetic pole having a magnetic polarity which interacts with said second magnetic pole of said at least one permanent magnet to tend to urge said table in a desired direction along said linear axis.

4,560,912

OBJECT SENSING APPARATUS FOR AN AUTOMATIVE DOOR

Bert O. Jönsson, Vintrie, Sweden, assignor to Bert O. Jönsson, Sweden

Continuation of Ser. No. 347,793, Feb. 11, 1982, Pat. No. 4,467,251, which is a continuation-in-part of Ser. No. 155,008, May 30, 1980. This application Aug. 20, 1984, Ser. No. 642,524
Claims priority, application Sweden, May 31, 1979, 7904749
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] G05B *5/00*
U.S. Cl. 318—480 **10 Claims**



1. Control apparatus for an automatic door having motor operated means for swinging said door open in a selected first direction path from a door frame in response to the approach of an object from a second direction, and for inhibiting opera-

tion of said motor operated means in response to the presence of an object in said first direction path of said door, comprising:

a first object sensing apparatus, mounted on said door and facing said first direction;

a second object sensing apparatus, mounted on said door and facing in said second direction;

said first and second sensing apparatus each comprising means for emitting a diverging beam of diffuse radiation in response to a supplied electrical signal, means supplying an electrical signal to said emitting means, radiation detecting means for providing an output signal representative of the presence of an object; and

a control circuit for:

(1) activating said motor means to open said door in response to the output signal from said second sensing apparatus;

(2) activating said motor means to maintain said door in an open position in response to the output signal from said second sensing apparatus, and

(3) inhibiting operation of said motor means and preventing opening of said door in response to the output signal from said first sensing apparatus.

4,560,913

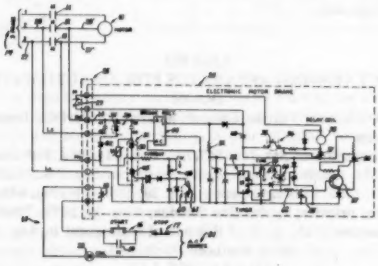
SPARKLESS CIRCUIT FOR LOW HORSEPOWER ELECTRONIC MOTOR BRAKE

Young K. Min, Milwaukee County, Wis., assignor to PT Components, Inc., Indianapolis, Ind.

Filed Nov. 30, 1983, Ser. No. 556,288

Int. Cl.⁴ H02P *3/24*

U.S. Cl. 318—760 **9 Claims**



1. For use with integral and fractional low horsepower electric motors energized by an AC power supply, an AC powered electronic motor brake circuit including means for converting AC to DC for effecting dynamic braking of the motor, relay means for connecting and disconnecting said brake circuit with the AC power supply, and means for effecting substantially spark-free operation of said relay means comprising first control circuit means having a first opto-coupler means operably responsive to AC energy generated by the motor after disconnection thereof from said AC power supply to condition said relay means for contact closing operation and for preventing energization of said brake circuit until after contact closing operation of said relay means is completed, said contact closing operation serving to connect said brake circuit with said AC power supply; and additional control circuit means including second opto-coupler means operable to de-energize said relay means and disconnect the AC power supply therefrom after said brake circuit is de-energized.

4,560,914

HIGH VOLTAGE AMPLIFIER FOR CAPACITIVE LOAD

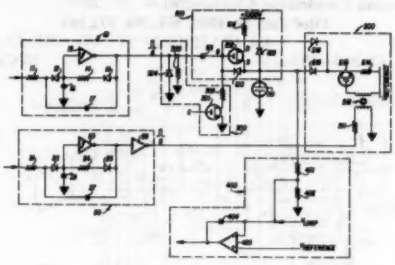
Fernande F. Lafonta, and Paul A. Lafonta, both of Paris, France, assignors to ETAT Francais, Paris Armees, France

Filed Mar. 19, 1984, Ser. No. 590,768

Claims priority, application France, Mar. 18, 1983, 83 04431

Int. Cl.⁴ H03G *3/00*; H04R *19/01*; H03F *1/42*; H02J *1/00*

U.S. Cl. 320—1 **15 Claims**



1. A supply device for producing and controlling a step-wise voltage for a capacitive load, the device comprising:

circuit means for producing an alternate low voltage control signal;

an input capacitor having first and second terminals and a capacitance which is much lower than that of the capacitive load, where said alternate control signal is applied to the first terminal of said input capacitor;

a non-linear high voltage element comprising an active tripole with a control dipole, where one of the poles of the control dipole is connected to the second terminal of the input capacitor while the other pole of the control dipole is connected to one of the terminals of the input capacitive load, the other terminal of said capacitive load being connected to ground;

a low leak, low capacitance diode connected between the two poles of said control dipole so as to constitute a closed circuit with the latter which accepts current that flows in only one direction under normal operating conditions.

4,560,915

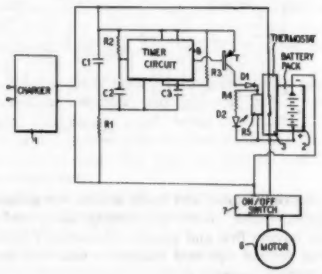
ELECTRONIC CHARGING CIRCUIT FOR BATTERY OPERATED APPLIANCES

Setrak D. Soultanian, Chicago, Ill., assignor to Wen Products, Inc., Chicago, Ill.

Filed Aug. 23, 1984, Ser. No. 643,400

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—35 **13 Claims**



9. A charging circuit for a rechargable battery pack for use with a charger having an output terminal connected to said battery pack comprising:

a normally closed thermostat in thermal contact with said battery pack and connected to another output terminal of said charger, said thermostat opening after discharge of said battery pack due to heating thereof associated with said discharge;

a power resistor in thermal contact with said thermostat and also connected to said another output terminal of said charger;

a normally non-conducting transistor having an output electrode connected to said power resistor and having a control electrode; and

a timer circuit having an output connected to said control electrode, said timer circuit and said transistor being connected in parallel across said thermostat,

said timer circuit automatically supplying a signal to said control electrode of said transistor after a selected period of time following opening of said thermostat for switching said transistor to a conducting state for permitting charging of said battery pack at a full charging rate only after said battery pack has cooled to a temperature sufficient to permit said thermostat to again close, said thermostat again opening after said battery pack is substantially fully charged due to heating thereof associated with said charging.

4,560,916

ALTERNATING CURRENT GENERATOR SYSTEM FOR A CAR

Iwaki Yoshiyuki; Matsumoto Akio, and Yokota Mitsuyoshi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

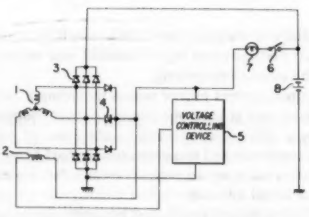
PCT No. PCT/JP83/00177, § 371 Date Jan. 27, 1984, § 102(e) Date Jan. 27, 1984

PCT Filed Jun. 1, 1983, Ser. No. 576,390

Claims priority, application Japan, Jun. 2, 1982, 57-83085[U]

Int. Cl.⁴ H02J *7/14;* H02P *9/10*

U.S. Cl. 322—86 **3 Claims**



1. An alternating current generator system for a car, comprising:

a field coil;

an armature coil having a three-phase connection to generate an alternating current output;

a rectifying device for rectifying the alternating current output from said armature coil;

a battery to be charged with the output of said rectifying device;

a voltage controlling device for turning on and off a field current passing through said field coil;

a solar battery;

a switch connected between said solar battery and said battery for comparting the voltage from the said solar battery to a threshold value and supplying said field current from said battery when said voltage is below said threshold value and supplying said field current from said solar battery when said voltage is above said threshold value; p1 charging means for charging said battery from said solar battery;

wherein said field current is supplied separately from said rectified output when said voltage from said solar battery exceeds said threshold value, so as to produce an increased output; and

wherein said battery is charged when the voltage of said solar battery exceeds the voltage of said battery.

4,560,917

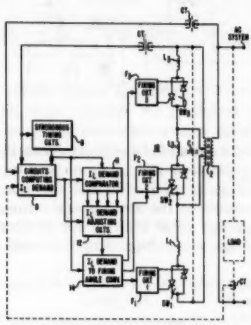
STATIC VAR GENERATOR HAVING REDUCED HARMONICS

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,059

Int. Cl.⁴ G05F *1/70*

U.S. Cl. 323—210 **2 Claims**



1. A static VAR generator, comprising:

(a) a transformer having primary windings connected to an AC network and secondary windings having a multitude of voltage taps therein;

(b) switching means comprising a plurality of antiparallel connected thyristors connected to said secondary windings for connecting inductors to the AC network for regulating reactive power;

(c) a first reactance connected to the switching means and parallel with the secondary windings;

(d) a plurality of reactances each connected in series with one of the antiparallel connected thyristors with the switching means connecting each inductor individually to one of said multiple voltage taps; and

(e) control means connected to said AC network and said switching means for controlling the connection of the inductors to the AC network in response to the reactive power requirements wherein one of said plurality of inductors is individually and continuously phase-angle fired to control the reactive power of the AC network in combination with on/off control of the other of said plurality of said inductors.

4,560,918

HIGH-EFFICIENCY, LOW-VOLTAGE-DROP SERIES REGULATOR USING AS ITS PASS ELEMENT AN ENHANCEMENT-MODE FET WITH BOOSTED GATE VOLTAGE

Patrick J. Callen, Yardley, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 2, 1984, Ser. No. 595,932

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 323—273 **1 Claim**

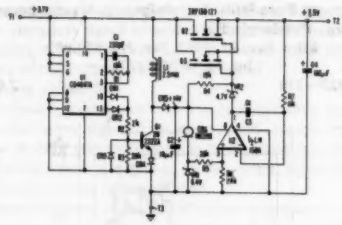
1. A series regulator comprising:

common and input terminals for receiving an applied input voltage;

an output terminal for supplying an output level which is to be regulated to a prescribed value;

at least one field effect transistor, having a channel con-

nected between said input and output terminals, and having a gate electrode between which and said common terminal a voltage must appear that is larger than said input voltage applied between said input terminal and said common terminal, in order to control the conduction of said channel as output voltage approaches the input voltage in value, which gate electrode connects to a control voltage node;



a voltage boost circuit for developing from the input voltage appearing between said common and input terminals a larger voltage as referred to said common terminal;

means responsive to the amount said output level exceeds said prescribed value therefor for developing said error signal voltage as a voltage drop from said larger voltage; and

means for applying said error signal voltage to said control voltage node.

4,560,919

CONSTANT-VOLTAGE CIRCUIT INSENSITIVE TO SOURCE CHANGE

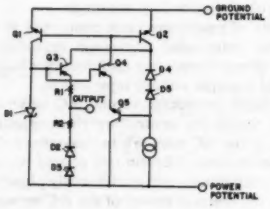
Hitoshi Ishikawa, and Kenji Kano, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,434

Claims priority, application Japan, Nov. 30, 1983, 58-228028

Int. Cl.[4] G05F *3/18*

U.S. Cl. 323—314 **16 Claims**



1. A constant-voltage circuit comprising:

a first reference potential;

a second reference potential being different in electric potential from said first reference potential;

a first transistor (Q1) of a first polarity having an emitter, a collector and a base, said emitter of said first transistor being connected to said first reference potential;

a second transistor (Q2) of said first polarity having an emitter, a collector and a base, said emitter of said second transistor being connected to said first reference potential with said base being connected to said base of said first transistor;

a reference voltage generating means (D1) connected between said collector of said first transistor and said second reference potential;

a third transistor (Q3) of a second polarity different from said first polarity having an emitter, a collector and a base, said base of said third transistor being connected to the junction between said reference voltage generating means and said first transistor, with said collector being connected to said collector of said second transistor;

a divider circuit (R1, R2, D2, D3) having a dividing point serving as an output terminal, said divider circuit being connected between said emitter of said third transistor and said second reference potential;

a p-n junction element (D4, D5) having one end and other end, said one end being connected to said collector of said second transistor;

a constant-current source (C) connected between said other end of said p-n junction element and said second reference potential; and

an active element (Q4, Q5) having a p-n junction, said p-n junction being connected between said base of said third transistor and said other end of said p-n junction element.

4,560,920

VOLTAGE TO CURRENT CONVERTING CIRCUIT

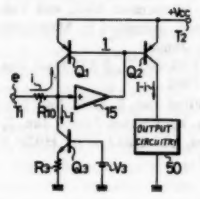
Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,318

Claims priority, application Japan, May 30, 1983, 58-95355

Int. Cl.[4] G05F *3/08*

U.S. Cl. 323—315 **20 Claims**



1. A voltage to current converting circuit for converting an input signal voltage at an input terminal into an output signal current, the circuit comprising:

input-output current mirror means including a current input transistor and at least one current output transistor having the base thereof connected to the base of said current input transistor and the collector thereof being an output for connection to an output means for developing the output signal current;

input resistor means connected between the input terminal and the collector of said current input transistor;

non-inverting current amplifier means having an input connected to the collector of said current input transistor and an output connected to the bases of said current input and output transistors; and

a constant reference current source connected to the collector of snid current input transistor for providing a substantially constant reference current thereto.

4,560,921

COMPARATOR CIRCUIT WITH BUILT IN REFERENCE

Mineo Yamatake, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 15, 1984, Ser. No. 620,788

Int. Cl.[4] H03F *3/45*

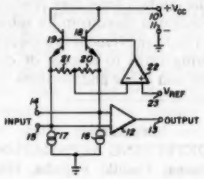
U.S. Cl. 323—316 **10 Claims**

1. A comparator circuit having a pair of differential signal input terminals, a single-ended output and an input biasing circuit, said input bias circuit comprising:

current sink means coupled to said signal input terminals;

current source means coupled to said signal input terminals; and

means, responsive to the common mode potential at said signal input terminals, for controlling one of said current sink



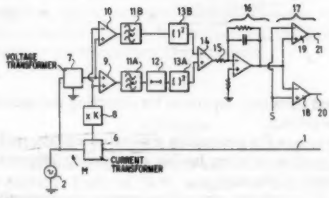
means and said current source means, to produce a reference bias at said signal input terminals.

4,560,922

METHOD FOR DETERMINING THE DIRECTION OF THE ORIGIN OF A DISTURBANCE AFFECTING AN ELEMENT OF AN ELECTRICAL ENERGY TRANSFER NETWORK

Isabelle Heller, Sevres, France, and Paul Loewenstein, Mountain View, Calif., assignors to Enertec, Montrouge, France

Continuation of Ser. No. 324,247, Nov. 23, 1981, abandoned.
This application Oct. 31, 1984, Ser. No. 665,514
Claims priority, application France, Nov. 25, 1980, 80 24946
Int. Cl.[4] G01R *31/08;* H02H *3/38*
U.S. Cl. 324—52 **11 Claims**



6. A method for determining, at a measuring point situated at one end of a protected section of an electricity transmission line, the direction relative to that point of the origin of a disturbance affecting the protected section, comprising the steps of:

(a) measuring the voltage and current of a signal arising as a result of said disturbance at the measuring point and developing voltage and current responsive signals;

(b) processing by summing and filtering the voltage and current responsive signals to obtain a first signal;

(c) filtering the current responsive signal;

(d) multiplying together the first signal and the filtered current responsive signal to obtain a second signal; and

(e) integrating said second signal to produce an output signal having an algebraic sign indicative of the direction of said disturbance relative to the measuring point.

4,560,923

MOISTURE ANALYZER

Colin J. Hanson, 22719 Rio Reyes Ct., Valencia, Calif. 91355

Filed Nov. 15, 1983, Ser. No. 551,846
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 QL **20 Claims**

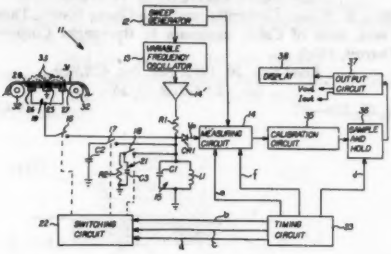
1. A moisture analyzing system comprising:

a frequency-modulated voltage source;

an antenna means coupled to said source and arranged to apply an alternating electric field to a material being tested for moisture content;

an LC tank circuit connected in parallel with said antenna means;

a resistance means connected between said source and said parallel combination of said antenna means and said tank circuit; and



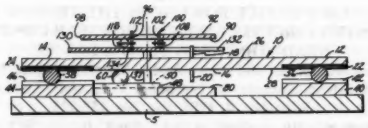
measurement circuit means detecting the level of resonant voltage peak output signals V_O produced by said tank circuit and providing therewith sensing signals V_S indicative of the moisture content of the material being tested.

4,560,924

FLATNESS MEASURING APPARATUS

Robert B. Nordberg, Minneapolis, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jul. 22, 1983, Ser. No. 516,828
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R **18 Claims**



1. An apparatus for measuring the flatness of an object surface, comprising:

a flat reference surface, and meansfor supporting an object surface with respect to said reference surface;

a first sensing means;

a second sensing means;

a carriage, supported for lateral movement with respect to said reference surface and object surface, for supporting said first and second sensing means, said carriage having first and second opposed sides, said first sensing means supported on said first side and said second sensing means supported on said second side, said first side facing said object surface and said second side facing said reference surface, whereby said lateral movement carries said first sensing means laterally across said object surface and carries said second sensing means laterally across reference surface;

a means for providing relative movement between said carriage and said surfaces whereby said first sensing means generates information relative to said object surface and said second sensing means generates information relative to said reference surface; and

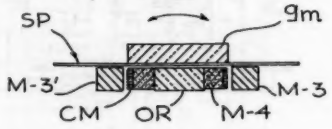
means for utilizing said information from said first sensing means with said information from said second sensing means to generate information representative of the flatness of said objective surface.

4,560,925

MIRROR POSITION SENSOR AND ASSOCIATED PIVOT SUSPENSION FOR IMPROVED TRACK SELECTION IN OPTICAL DATA DISK SYSTEM

Jeffrey E. Niven, Camarillo, and Der-Chang Hsieh, Thousand Oaks, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 30, 1982, Ser. No. 428,929
Int. Cl.⁴ G01R *13/38*
U.S. Cl. 324—97 **18 Claims**



1. Apparatus for automatically accommodating the single axis pivoting of rotatable load means, the apparatus being adapted to provide a "pivot-signal" whose variance corresponds to said pivoting, and including:

magnetic pivot motor means adapted to controllably pivot the load means; and

housing means adapted to mount the load means;

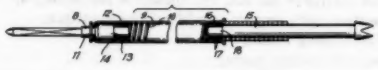
said load means being mounted on a prescribed flexure-strip pivot suspension means, adapted to function as a torsion bar flexure; this flexure-strip being formed of a thin flat sheet of flexible metal stock relieved relatively centrally to provide a center-plate joined to an outer ring portion by a pair of like thin opposed land portions, said motor means including a magnetic circuit surrounding a "core zone", said suspension means being disposed in this "core-zone".

4,560,926

CONTACT DEVICE FOR USE IN THE TESTING OF PRINTED CIRCUITS AND A REMOVABLE CONTACT HEAD FOR USE IN SUCH A DEVICE

Roger Cornu, Aigle, and Pierre-André Meier, Antagnes, both of Switzerland, assignors to Technobal S.A., Aigle, Switzerland

Filed Jan. 4, 1983, Ser. No. 455,524
Claims priority, application Switzerland, Jan. 8, 1982, 88/82
Int. Cl.⁴ G01R *1/06*
U.S. Cl. 324—158 P **3 Claims**



1. A contact device for use in the testing of printed circuits comprising a guide tube, a coiled compression spring housed in the tube, a contact head mounted for axial sliding motion in the tube against the action of the spring, and a seating member carrying the tube, wherein:

the guide tube is fixedly secured to the seating member,

the spring has one end portion fixedly secured adjacent the seating member, the other end portion of the spring being formed with a plurality of mutually contacting turns and the turns of the spring having an outer diameter less than the inner diameter of the guide tube, said other end portion having a final turn; and

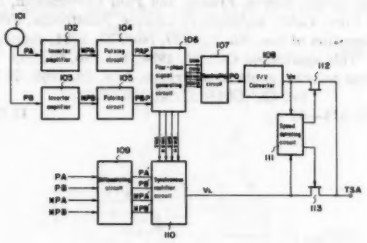
the contact head is removably secured to said other end portion of the spring and comprises therefrom a smooth cylindrical, retaining end portion having a tapering engagement tip, the inside surface of the guide tube being formed with a sloping shoulder against which bears said final turn to tighten said final turn against said retaining end protion of the contact head when the latter is not urged inwardly of the tube, said retaining end portion having a diameter very slightly greater than the inner diameter of the turns at said other end portion of the spring whereby the contact head may readily be engaged in the tube or withdrawn therefrom by subjection of the contact head to a rotary movement in a direction opposite to that of the spring turns to engage or disengage said retaining end from said other end portions of the spring.

4,560,927

SPEED DETECTING APPARATUS

Hiroshi Ishida, Nishitama; Yoshiki Fujioka, Higashiyamato, and Naoto Ota, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00136, § 371 Date Dec. 13, 1982, § 102(e) Date Dec. 13, 1982, PCT Pub. No. WO82/03692, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 23, 1982, Ser. No. 456,001
Claims priority, application Japan, Apr. 22, 1981, 56-060964
Int. Cl.⁴ G01P *3/46*
U.S. Cl. 324—166 **8 Claims**



6. A speed detecting apparatus for detecting the speed of the motor, comprising:

detector means for generating sine-wave signals, $\pi/2$ out of phase with each other, having a frequency proportional to the speed of the motor;

frequency-to-voltage converter means, operatively connected to said detector, for converting the frequency of the sine-wave signals into a voltage;

low velocity signal means, operatively connected to said detector, for outputting a low velocity signal by rectifying and combining the sine-wave signals; and

switching means, operatively connected to said frequency-to-voltage converter means and said low velocity signal means, for supplying one among the low velocity signal and the converted voltage in dependence upon the speed of the motor.

4,560,928

VELOCITY OR DISTANCE MEASURING APPARATUS USING MAGNETIC DIPOLES

Ian Hayward, Blythe, England, assignor to British Gas Corporation, London, England

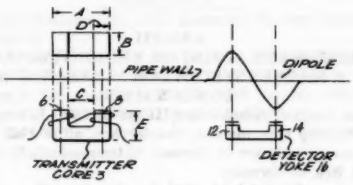
Continuation of Ser. No. 330,473, Dec. 14, 1981, abandoned, which is a continuation of Ser. No. 231,354, Feb. 4, 1981, abandoned, which is a continuation of Ser. No. 67,018, Aug. 16, 1979, abandoned. This application Aug. 22, 1984, Ser. No. 642,714
Claims priority, application United Kingdom, Jan. 5, 1979, 7900475
Int. Cl.⁴ G01P *3/50*; G01B *7/14*
U.S. Cl. 324—172 **9 Claims**

1. Apparataus mounted on a vehicle for measuring velocity and/or distance travelled by the vehicle on a ferromagnetic surface, comprising:

means for transmitting including a transmitter core with at least two spaced transmitter faces for implanting spaced

magnetic dipoles with a given spatial geometry on said ferromagentic surface;

means for detecting located on said vehicle at a given distance remote from said means for transmitting for generating detection signals upon detection of said implanted magnetic dipoles, and including an electrical bridge comprising at least two magnetic sensing means connected in respective arms of said bridge, the spatial separation of said at least two magnetic sensing means corresponding with the spatial geometry of said at least two spaced transmitter faces;



means for triggering said means for transmitting in response to said detection signals to implant a magnetic dipole in said ferromagnetic surface; and

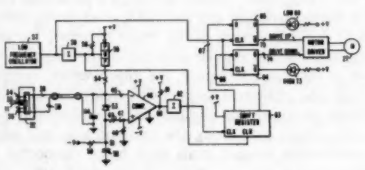
means for processing said detection signals to provide corresponding output signals with each output signal being a function of the time elapsed between the implantation of one of said magnetic dipoles and the detection of said one magnetic dipole, and said processing means including a discrimination circuit for processing detection signals having a predetermined characteristic.

4,560,929

POSITION DETECTOR APPARATUS AND METHOD UTILIZING DAMPED OSCILLATIONS

George Melnyk, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,523
Int. Cl.[4] G01B 7/14; G01N 27/00; G08B 19/00
U.S. Cl. 324—207 **14 Claims**



1. Apparatus for sensing the position of an electrically conductive element comprising:

electrical circuit means energizable to create a decaying series of oscillations therein including magnetic transducer means for creating a magnetic field within which said element can move, said element having eddy currents induced therein and varying the rate of decay of said oscillations according to the position of said element within said field;

means operatively connected to said electrical circuit means for periodically energizing said circuit means; and

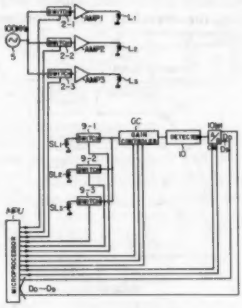
means operatively connected to said electrical circuit means for counting the oscillations of said circuit means that exceed a predetermined threshold value following each said energization with said count being an indication of the position of said element.

4,560,930

DISTANCE-MEASURING SYSTEM USING ORTHOGONAL MAGNETIC FIELD GENERATORS AND ORTHOGONAL MAGNETIC FIELD SENSORS

Tsutomu Kouno, 8-104, 8-ban, 6-chome, Tsurukawa, Machida-shi, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,663
Claims priority, application Japan, Jun. 27, 1982, 57-110263
Int. Cl.[4] G01B 7/14; G01R 33/02
U.S. Cl. 324—207 **8 Claims**



1. A magnetic field responsive distance indicating system comprising a magnetic field generator means for generating an alternating magnetic field, said generator means including first, second and third magnetic field generator coils arranged adjacent and perpendicular to one another, sensor means for converting the alternating magnetic fields generated by the first, second and third magnetic field generator coils into alternating voltages, the sensor means including first, second and third magnetic fields to signal generating converter means arranged adjacent and perpendicular to one another, first, second and third square law means for squaring output signals of said first, second and third converter means applied thereto, a first adder means responsive to the outputs of said first, second and third square law means for deriving a sum signal, first second and third driver means for sequentially driving said first, second and third magnetic field generator coils, a first memory means for storing the sum signal derived by said first adder means while the first magnetic field generator coil is driven by said first driver means, a second memory means for storing the sum signal derived by said first adder means while the second magnetic field generator coil is driven by said second driver means, a third memory means for storing the sum signal derived by said first adder means while the third magnetic field generator coil is driven by said third driver means, a second adder means for adding the sum signals stored in said first, second and third memory means to derive a summation signal, and means for obtaining the six power root of the summation signal derived from said second adder means to convert it into a signal having a value representing the reciprocal of the sixth root of the summation, whereby a signal proportional to the distance between said magnetic field generator means and said sensor means is derived from said operational means.

4,560,931

SELF-PROPELLED MOBILE PIPELINE INSPECTION APPARATUS AND METHOD FOR INSPECTING PIPELINES

Shinichi Murakami, Osaka, and Takao Mihara, Matsubara, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jul. 29, 1982, Ser. No. 403,030
Claims priority, application Japan, Aug. 7, 1981, 56-124390
Int. Cl.[4] G01N 27/87, 29/04; G01D 9/00; G03B 29/00
U.S. Cl. 324—220 **11 Claims**

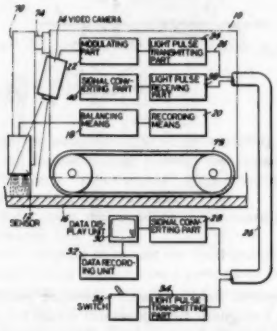
1. An apparatus for inspecting the state of the inner surface

of pipes, and equipped with a mobile truck having traveling means on both sides thereof for propelling the mobile truck through a pipe, said apparatus further comprising:

a flaw-detecting sensor mounted at a lower end of a rotating arm, the sensor being adapted for sensing flaws in the pipe wall;

a rotating mount provided on the mobile truck and connected to an upper end of the rotating arm for rotating the arm reciprocably in the circumferential direction of the pipe so as to rotate the sensor reciprocably in said circumferential direction;

a central operation unit located outside the pipe for remotely controlling the traveling means for propulsion of the



mobile truck and the rotating mount of the mobile truck for reciprocating the rotating arm, the central operation unit and the mobile truck being operably connected by a communication cable;

a data recording unit provided at the central operation unit and operably connected to the sensor, for recording output signals produced by the sensor; and

a video camera mounted on the mobile truck, for viewing the inner surface of a pipe at locations over which the sensor is rotated, output signals from the video camera being sent to the central operation unit by means of an optical fiber communication cable operably connecting the mobile truck and the central operation unit.

4,560,932

MAGNETO-OPTICAL CONVERTER UTILIZING FARADAY EFFECT

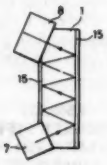
Tsutomu Mitsui; Konji Tada; Yoshiki Kuhara, and Masami Tatsumi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 31, 1983, Ser. No. 462,177

Claims priority, application Japan, Jan. 29, 1982, 57-13786

Int. Cl.⁴ G01R *33/032*

U.S. Cl. 324—244 **10 Claims**



1. A magneto-optical converter comprising a body of material exhibiting the Faraday effect, magnetic means having spaced apart ends with a magnetic field extending therebetween, said body being disposed between said ends and having a receiving end, an exiting end opposite the receiving end, and a pair of reflecting surfaces located on opposite sides of the body perpendicular to said magnetic field to increase the path length of light passing therethrough, a polarizer for directing a beam of light into a receiving end of said body of material, and an analyzer for picking up the light exiting from an exiting end of said body of material, said polarizer and said analyzer being polarizing beam splitters with said polarizer being arranged for directing a beam of polarized light in a direction perpendicular to the direction of an incident light beam whereby an incident light beam directed to said polarizer will be disposed perpendicular to said magnetic field and a light beam leaving said body and entering said analyzer will exit said analyzer perpendicular to said magnetic field.

4,560,933

APPARATUS FOR ADJUSTABLY MOUNTING COILS OF A MAGNET SYSTEM FOR NUCLEAR SPIN TOMOGRAPHY

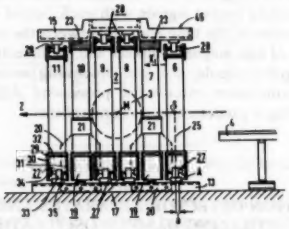
Helmut Forster, Neunkirchen; Horst Siebold, Erlangen, and Karl-Georg Heinzelmann, Neunkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,249

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1982, 3227844

Int. Cl.⁴ G01R *33/08*

U.S. Cl. 324—319 **20 Claims**



1. In a nuclear spin tomography system having n adjustably positionable magnet coils aligned with each other along a common axis for generating a homogeneous magnetic base field, the tomography system including a mounting apparatus with a frame structure and mechanical adjusting devices secured to stationary parts of the frame structure for adjusting the translational and angular positions of the magnet coils with respect to the frame structure, the improvement comprising:

at least one additional magnet coil rigidly connected to the frame structure and aligned with the adjustably positionable magnet coils along the common axis, said adjustably positionable magnet coils each being connected to said frame structure via three of the mechanical adjusting devices, said magnet coils forming an array having a geometrical center, each of said adjustably positionable magnet coils having a center of gravity defining a respective center of gravity plane oriented substantially parallel to the windings of the respective magnet coil and at least approximately perpendicularly to said common axis, and

support means included in the mounting apparatus for transmitting the weight of the n adjustably positionable magnet coils to said frame structure, said support means including at least n first support elements each rigidly attached to a respective adjustably positionable magnet coil and each being provided with a concave spherical surface defining a recess, said support means further including at least n second support elements each in the shape of a spherical sector having a planar surface slidably engaging a horizontal surface of said frame structure and a convex spherical surface slidably engaging the concave spherical sur-

face of a respective first support element, the support elements associated with an adjustably positionable magnet coil defining at least one support point at which weight is transferred from the respective magnet coil to the frame structure, said support point being spaced from the center of gravity plane of the respective magnet coil on a side of such plane opposite said geometrical center, thereby giving rise to a mechanical couple operating on the respective magnet coil and tending to shift the top thereof towards said geometrical center.

4,560,934

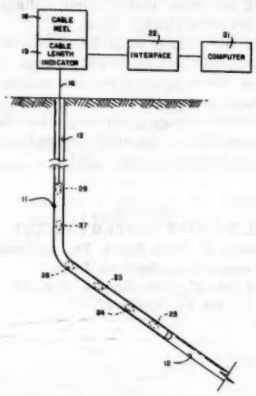
METHOD OF TRANSPORTING A PAYLOAD IN A BOREHOLE

Ben W. O. Dickinson, III, 2125 Broderick St., San Francisco, Calif. 94115

Division of Ser. No. 461,768, Jan. 28, 1983, Pat. No. 4,524,324, which is a continuation-in-part of Ser. No. 347,304, Feb. 9, 1982, abandoned. This application Dec. 6, 1984, Ser. No. 679,578

Int. Cl.⁴ G01V *3/18;* **E21B** *29/02, 47/00, 47/022*

U.S. Cl. 324—323 **10 Claims**



1. In a method of transporting a payload which emits or receives electrical signals in a bore hole in the earth, the steps of: encasing the payload in an elongated flexible mass of cushioning material and a flexible outer casing of high tensile strength to form an axially elongated flexible probe which can travel around bends of relatively short radius, connecting an electrically conductive cable to the payload for carrying signals between the payload and the surface of the earth, securing the cable to the flexible casing with the cable extending axially from one end of the probe, inserting the probe into the bore hole, and applying pressurized fluid to the bore hole above the probe to propel the probe through the bore hole.

4,560,935

REMOTE ACTUATOR FOR METAL DETECTOR DISCRIMINATING ADJUST SWITCH

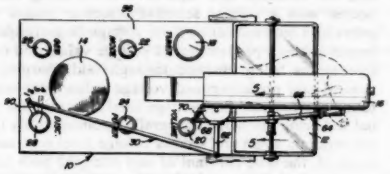
Ronald E. Williams, Rte. 1, Box 739 W, Moore Haven, Fla. 33471

Filed Mar. 28, 1983, Ser. No. 479,805

Int. Cl.⁴ G05G *1/00;* **G01U** *3/15*

U.S. Cl. 324—326 **3 Claims**

1. In combination with a metal detector of the type including an oscillatable discriminating adjust switch operator remote from a hand engageable support handle for the detector, a control actuator shiftably supported from said detector for back and forth movement of a portion of said actuator along a predetermined path closely adjacent said handle and engageable by a digit of a hand grasping said handle for displacing said actuator along said predetermined path, and connecting means operatively connecting said control actuator and said switch actuator for oscillation of the latter in response to back and forth movement of the control actuator, detent means with which said control actuator is operatively engageable for tactile indication of predetermined positions of said actuator along said predetermined path, said detent means including adjustment means operative to selectively adjust said predetermined positions along said predetermined path and relative to each other along said path, said connecting means including adjustment structure operative to selectively adjust the positioning of said control actuator along said path relative to a predetermined position of said switch actuator.



4,560,936

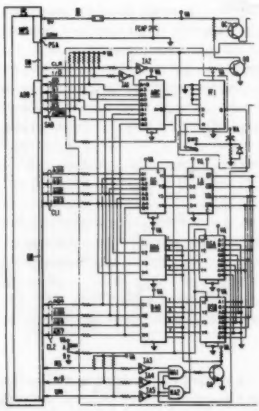
PROGRAMMABLE CONTROLLER SYSTEM WITH FAILURE INDICATOR

Kenneth R. Pelowski, Farmington Hills, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1984, Ser. No. 685,883

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—418 **2 Claims**



1. A switch system with failure indicator for controlling an electrical current to a load system which remains in a predetermined load state for a predetermined minimum time after the electrical current therefor ceases to flow and which changes load state after said minimum time unless said current is earlier reapplied, comprising:

switch means with control terminal interconnectable with said load system and a power supply for causing electrical conduction in said load system when turned on and for causing said electrical conduction to cease when turned off, said switch means having a test terminal on which exists a first voltage level when said switch means is on and a second voltage level when said switch means is off;

control means interconnected with said control terminal for causing said switch means to turn on and off as desired;

simulating means interconnected with said control terminal for providing a periodic overriding off signal of predetermined duration and period of repetition when said switch means is on, said predetermined duration being less than said minimum time;

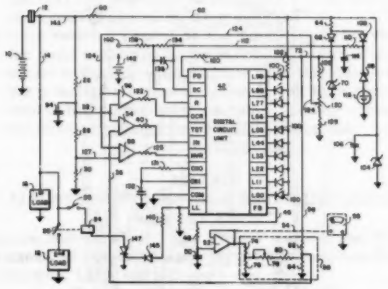
failure detector means including capacitive means with charging path and discharging path interconnected with said test terminal, said capacitive means being interconnected with a voltage sensitive indicator means which provides a fault indication if the voltage on said capacitive means attains a predetermined voltage value, said capacitive means being charged through said charging path toward said predetermined voltage value from said test terminal when said first voltage level is on said test terminal and being discharged generally instantaneously to said test terminal when said second voltage level is on said test terminal, the time constant of said charging path relative to the period between each said periodic overriding off signal being such that said predetermined voltage value for said voltage sensitive indicator is not reached because said capacitive means is discharged each time prior thereto unless said controllable switch means does not corresponding switch off at the beginning of each said periodic off signal in which case said capacitive means will not be discharged causing said voltage value for said voltage sensitive indicator to be attained, thus causing said indicator means to indicate a failure.

4,560,937

BATTERY STATE OF CHARGE METERING METHOD AND APPARATUS

Eugene P. Finger, Brewster, N.Y., assignor to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,671
Int. Cl.[4] G01N *27/42*
U.S. Cl. 324—433 **24 Claims**



1. A metering system for measuring and indicating the state of charge of an electrical storage battery comprising an oscillator and a digital integrator having a plurality of digital stages operable to store a numerical value in binary digital form which is indicative of state of charge, means for detecting decreases in state of charge in terms of decreases in battery terminal voltage under load and connected for providing resultant gating signals for gating pulses from said oscillator to said digital integrator, said digital integrator being operator in response to said pulses to change the numerical value stored therein in one direction as the battery is being discharged, means connected to said integrator and for deriving an analog output voltage signal representive of the numerical value stored in said integrator comprising switching means for generating a series of voltage pulses on a single output line with each pulse corresponding in length to the binary digital value stored in a predetermined number of the binary stages of said digital integrator to provide an output voltage signal having an average voltage amplitude corresponding to the length of said pulses, said means for detecting decreases in state of charge in terms of decreases in battery terminal voltage including means for detecting the terminal voltage of the battery and for generating a function of said battery terminal voltage,

means connected to receive said analog output voltage signal for generating a variable reference voltage signal which is a function of said analog output voltage signal representative of the numerical value stored in said integrator,

and means for comparing said last-named voltage functions as a basis for determining a battery discharge condition requiring a decrease in the state of charge indication stored by said integrator and operable to change the numerical value in said integrator,

said means for detecting the terminal voltage of the battery being operable to generate a function of the battery terminal voltage which is a substantially proportional fraction of the terminal voltage,

said means for generating a variable reference voltage signal comprising a resistor network which is operable to receive said integrator function generator signal and to also receive a substantially constant reference voltage signal and to generate said variable reference voltage signal as a combined function of said integrator analog output voltage signal and said constant reference voltage signal,

said variable reference voltage signal being lowered as a function of said integrator analog output voltage signal as the numerical value stored in said integrator indicates progressively lower states of charge,

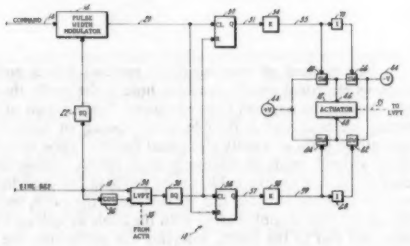
said variable reference voltage generating means being operable to generate an offset substantially linear function of said integrator analog output voltage signal.

4,560,938

FAIL-PASSIVE DRIVER CIRCUIT

Demetrius Poumakis, W. Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 27, 1984, Ser. No. 584,215
Int. Cl.[4] G05B *11/28*
U.S. Cl. 328—71 **2 Claims**



1. A fail-passive driver circuit for positioning an actuator in response to a command, wherein said actuator has a first input and a second input and is operable to decrease its position in response to a first voltage being applied to its first input while a second voltage is applied to its second input and is operable to increase its position in response to the first voltage being applied to its second input while the second voltage is applied to its first input, said circuit comprising:

means for providing a pulse-width modulated position request signal in response to the command wherein the phase shift of the position request signal within the modulation interval is a function of the command;

means for providing a phase shifted feedback signal in response to the position of the actuator;

a first bistable device, having a clock input connected for response to the position request signal and having a reset input connected for response to the feedback signal, for providing a first error signal in response to the amount of

time by which the feedback signal lags the position request signal;

a second bistable device, having a clock input connected for response to the feedback signal and having a reset input connected for response to the position request signal, for providing a second error signal in response to the amount of time by which the feedback signal leads the position request signal;

means for providing a first output drive signal in response to the first error signal;

means for providing a second output drive signal in response to the second error signal;

first switch means operable to provide the first voltage to the first input of the actuator in response to the provision of the first output drive signal;

second switch means operable to provide the first voltage to the second input of the actuator in response to the provision of the second output drive signal;

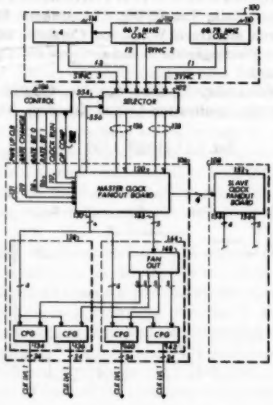
third switch means operable to provide the second voltage to the second input of the actuator in response to the nonprovision of the second output drive signal; and

fourth switch means operable to provide the second voltage to the first input of the actuator in response to the nonprovision of the first output drive signal.

4,560,939
SYNCHRONIZED SELECTABLE RATE CLOCKING SYSTEM

Clarence W. DeKarske, and Thomas M. Wilcoski, both of St. Paul, Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,885
Int. Cl.[4] H04J *3/06*; H03L *7/00*
U.S. Cl. 328—72 **4 Claims**



1. In a system having a plurality of sources of system clock signals and a plurality of clock pulse generators responsive to said system clock signals for producing clock phase signals, a circuit for controlling said clock pulse generators when a change is made from one of said sources of system clock signals to another, said circuit comprising:

selector means for applying system clock signals from one of said sources to said clock pulse generators;

means for generating a rate change signal and a code identifying a second of said sources as a new source of system clock signals to be applied to said clock pulse generators;

means responsive to said rate change code for stopping said clock pulse generators;

phase capture means for storing an indication of the phase output of one of said clock pulse generators at the time said clock pulse generators are stopped;

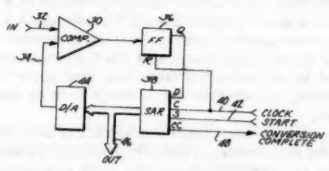
further means responsive to said rate change signal and said rate change code for controlling said selector means to select said second source of system clock signals while said clock pulse generators are stopped; and

means responsive to said phase capture means for restarting said clock pulse generators at a first time or a second time, whereby a change may be made from one of said sources of system clock signals to another without glitches or shortened phase signals being produced by said clock pulse generators.

4,560,940
PEAK AMPLITUDE MEASUREMENT

Albert van der Schans, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jun. 10, 1983, Ser. No. 503,118
Int. Cl.[4] H03K *5/153*
U.S. Cl. 328—150 **3 Claims**

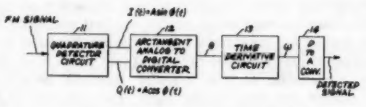


1. Apparatus for measuring the peak amplitude of an input signal, comprising, in combination: comparator means having a first input for receiving an input signal whose peak amplitude is to be measured and a second input for receiving a reference signal, said comparator means providing an output signal whenever the amplitude of said input signal exceeds the amplitude of said reference signal; latch means responsive to the output signal from said comparator means for providing a latch signal; a successive approximation register having a clock input for receiving clock signals and a drive input for receiving said latch signal, said register containing a digital count comprising a plurality of bits, said register being responsive to said clock signal and to said latch signal to operate on successively decreasing significant bits in said digital count to successively increase and decrease said digital count with each clock cycle, the increase or decrease of said digital count being based on the value of said latch signal; and converter means responsive to said digital count for providing said reference signal, said reference signal having an amplitude representative of said digital count.

4,560,941
FREQUENCY MODULATION DETECTOR USING DIGITAL SIGNAL VECTOR PROCESSING

Kenneth B. Welles, II, Schenectady, and Sharbel E. Noujaim, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,117
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—50 **8 Claims**



1. A detector for recovering a modulating signal from a

carrier modulated in frequency by the modulating signal comprising

means for generating first and second signals in phase quadrature and at a reference frequency substantially equal to the center frequency of said carrier,

means responsive to said phase-quadrature reference signals for converting the frequency modulated carrier into first and second baseband signals,

means for filtering the double reference frequency component of the first and second baseband signals to provide respective I and Q signals, the I and Q signals constituting in rectangular coordinates components of a vector represented in polar coordinates by R and θ, where R is the maximum amplitude of I and Q signals and θ is the instantaneous angle represented by the arctangent of the I signal divided by the Q signal,

means for inverting said I signal and said Q signal to provide respective $-I$ and $-Q$ signals,

means for sampling said I, $-I$, Q and $-Q$ signals at a frequency greater than twice the maximum deviation in frequency of said carrier produced by said modulating signal to obtain a sequence of sets of samples of said I, $-I$, Q, and $-Q$ signals, each set of samples being represented by a respective vector R and a respective angle θ consisting of a first angle component equal to zero or an integral number of octants and a second angle component less than an octant which is added to or subtracted from said first angle component depending on whether the vector R is in an odd or even octant,

first conversion means responsive to each of said sets of signal samples for providing a respective first binary number from 000 to 111 representing the first angle component of a respective angle θ,

second conversion means responsive to each of said sets of signal samples for providing a respective second binary number representing the second angle component of a respective angle θ,

means for combining the first binary number and the second binary number of each of said sets of samples to obtain a respective third binary number representing the respective angle θ thereof,

means for obtaining a sequence of changes in the value of said third binary numbers of successive sets of said sequence of sets of I, $-I$, Q, and $-Q$ signal samples, said sequence of changes representing changes in frequency of said carrier from the center frequency thereof corresponding to changes in amplitude of said modulating signal,

means for converting each number of said sequence of changes in the value of successive third binary numbers into a respective amplitude level whereby said modulating signal is recovered.

4,560,942

DEMODULATION CIRCUIT HAVING TRIANGULAR WAVE FOR BLOCKING HARMONICS

Dieter Janta, and Wolfgang Nolde, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 361,999, Mar. 25, 1982, abandoned. This application Apr. 3, 1985, Ser. No. 720,042

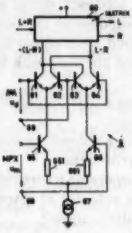
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114761

Int. Cl.⁴ H03D *1/04*

U.S. Cl. 329—101 **8 Claims**

1. In apparatus for demodulating a first signal having a predetermined carrier frequency, said apparatus comprising mixing means having a mixer output and first and second mixer inputs, means for creating a linear transfer function between said mixer output and said first input and an at least approximately hyperbolic tangent transfer function between said mixer output and said second input, and wherein undesired third and fifth harmonics of said carrier frequency appear at said mixer output, the improvement comprising:

means for generating a symmetrical triangular signal having a frequency corresponding to said carrier frequency and applying said triangular signal to said second mixer input,



said second triangular signal having an amplitude adapted to minimize said third and fifth harmonics at said mixer output.

4,560,943

F.M. DEMODULATOR WITH FAIL-SAFE FEATURES

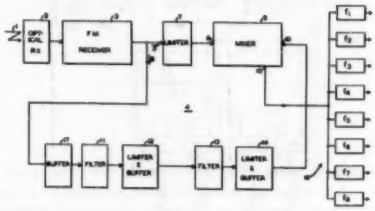
Paul D. Negus, Bath; Tak C. Ng, Chippenham; Roger Badge, Pucklechurch, and David W. Cowen, Corsham, all of England, assignors to Westinghouse Brake & Signal Co. Ltd., Chippenham, England

Filed May 12, 1983, Ser. No. 493,915

Claims priority, application United Kingdom, May 13, 1982, 8213995

Int. Cl.⁴ H03D *3/00, 3/02*

U.S. Cl. 329—103 **6 Claims**

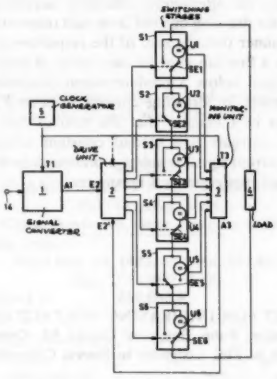


1. An F.M. demodulator comprising means for receiving an F.M. modulated signal, two parallel signal paths, means for mixing signals from the two paths to effect frequency demodulation and phase shifting means in one of signal paths operative to delay the phase of the signal one quarter of a cycle at the F.M. carrier frequency relative to the signal in the other path, said phase shifting means including in series to two two-pole Besel band-pass filter sections from which the respective capacitor in the series impedance arms has been omitted and the remaining components in the series and shunt impedance arms are selected to provide a linear frequency-phase change characteristic symmetrical with the required band-pass center frequency, each filter section includes said respective two-pole filter followed by a buffer circuit.

4,560,944
SWITCHING AMPLIFIER FOR DIGITAL POWER AMPLIFICATION

Andreas Furrer, Mönthal, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 18, 1984, Ser. No. 601,580
Claims priority, application Switzerland, May 10, 1983, 2546/83
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 9 Claims



1. A switching amplifier for digital power amplification of an analog input signal, comprising:

a signal converter;

a plurality of series-connected switching stages;

said signal converter comprising means for subdividing a predetermined input signal range of said input signal into a number of equal voltage steps corresponding to the number of said switching stages, means for continuously sampling the analog input signal via an input and generating control signals indicating that with a change in the amplitude of the input signal by one voltage step, one switching stage in the series circuit is to be switched in or out;

a drive unit receiving said control signals for producing control commands for driving the switching stages based on said control signals generated by the signal converter;

wherein before each switching process, an association between said voltage steps and said switching stages is redetermined; and

a monitoring unit for monitoring a predetermined operating condition of each of the switching stages and for controlling said association between voltage steps and switching stages in the drive unit in accordance with a determination of the predetermined operating conditions of each of said switching stages, said monitoring unit comprising:

a time-measuring device for measuring the time between two successive switching processes of each switching stage;

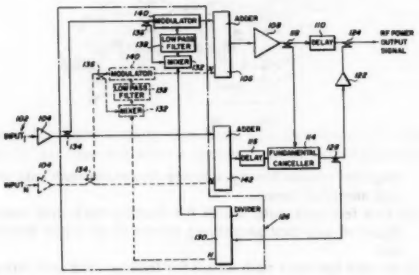
stores for storing the respective switching conditions; and

a comparison logic circuit connected to the time-measuring device and stores for comparing the time between two successive switching processes for each of said switching stages and, for the next switching process, selecting a switching stage for which switching is suitable according to its switching condition and which has not changed its switching condition for the longest time period.

4,560,945
ADAPTIVE FEEDFORWARD CANCELLATION TECHNIQUE THAT IS EFFECTIVE IN REDUCING AMPLIFIER HARMONIC DISTORTION PRODUCTS AS WELL AS INTERMODULATION DISTORTION PRODUCTS

Terence E. Olver, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 647,209
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—149 9 Claims



1. A feedforward cancellation circuit, comprising

(a) a plurality of input circuit means for receiving a plurality of fundamental tone signals, respectively;

(b) power bank amplifier means;

(c) adaptive feedforward cancellation means including a plurality of modulator means each connecting one of said input circuit means with the input of said power bank amplifier means, respectively, said power bank amplifier means amplifying said fundamental tone signals to produce a power output signal; and

(d) passive feedforward cancellation means having a first input for receiving a sample of said power output signal and a second input connected with said input circuit means for receiving samples of said fundamental tone signals, said passive cancellation means comparing said power output signal sample with said fundamental tone signal samples to produce a residue signal which is combined with said power output signal;

(e) said modulator means each including a first input connected with the output of said passive feedforward cancellation means for receiving a sample of said residue signal and a second input connected with its associated input circuit means for receiving a corresponding fundamental tone signal, said modulator means modulating the phase and amplitude of said fundamental tone signals, thereby to adaptively obtain and maintain deep cancellation nulls on each fundamental tone signal, respectively, whereby harmonic distortion is reduced.

4,560,946
POWER AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 21, 1984, Ser. No. 591,675
Claims priority, application Japan, Mar. 24, 1983, 58-49409
Int. Cl.[4] H03F *1/32*
U.S. Cl. 330—149 19 Claims

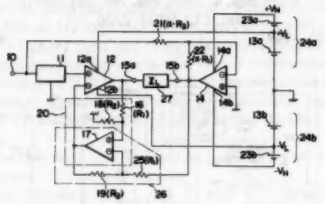
1. A power amplifier comprising:

(a) an input terminal for being supplied with an input signal;

(b) first and second terminals for connecting a load therebetween;

(c) first amplifier means for being supplied with a voltage from first voltage source means to amplify said input signal to apply an output signal to said first terminal;

(d) second amplifier means for being supplied with a voltage from second voltage source means to amplify said input signal to apply an output signal to said second terminal, said voltage from said second voltage source means being greater than said voltage from said first voltage source means, said second amplifier means having a higher power efficiency than said first amplifier means, and said first



amplifier means having a lower distortion than said second amplifier means;

(e) first feedback path means for feeding back said output signal of said first amplifying means to an input thereof; and

(f) second feedback path means for feeding back said output signal of said second amplifier means to said input of said first amplifier means.

4,560,947

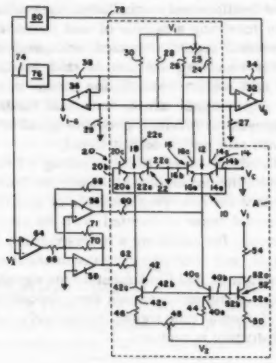
MONOLITHIC VOLTAGE CONTROLLED ELEMENT

Douglas R. Frey, 1211 Stafore Dr., Bethlehem, Pa. 18017

Continuation-in-part of Ser. No. 267,691, May 27, 1981, Pat. No. 4,471,320. This application Sep. 10, 1984, Ser. No. 648,889

Int. Cl.⁴ H03F *3/45*; H03G *3/10*

U.S. Cl. 330—254 **20 Claims**



1. A monolithically fabricated voltage controlled element comprising:

a. first and second pairs of transistors, each of said transistors having a base, an emitter and a collector;

b. second transistors of each pair having their bases connected together;

c. first transistors of each pair having their bases connected together;

a control voltage being applied between said connected pairs of bases;

d. emitters of said transistors of said respective pairs being connected together, respective paired emitters being connected to switchable means for drawing current therefrom, operating in response to an input current signal;

e. said switchable current drawing means drawing respective currents from said respective emitters, the difference of which corresponds accurately to said input current signal, and including:

(i) means for drawing current from said respective emitters in a manner that the sum of the respective drawn currents is a first constant for any value of said input current signal below a predetermined maximum;

(ii) means for drawing current from said respective emitters in a manner that the sum of the respective drawn currents is a second contant whenever said input current signal is below a predetermined value less than said predetermined maximum; and

(iii) means for alternately selectably actuating (1) said means for drawing current from said respective emitters in a manner that the sum of the respective drawn currents is a first constant for any value of said input current signal below a predetermined maximum and (2) said means for drawing current from said respective emitters in a manner that the sum of the respective drawn currents is a second constant whenever said input current signal is below a predetermined value less than said predetermined maximum.

4,560,948

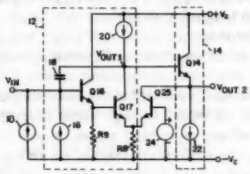
CIRCUIT FOR INCREASING VOLTAGE GAIN

John S. Prentice, Palm Bay, and Gerald M. Cotreau, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 12, 1984, Ser. No. 630,280

Int. Cl.⁴ H03G *3/30*; H03F *1/34*

U.S. Cl. 330—282 **18 Claims**



1. An operational amplifier, comprising:

a voltage input;

a voltage gain stage having an input connected to said voltage input, a first voltage output and an output impedance;

a buffer stage connected between said first voltage output and a second voltage output; and

feedback means, connected between said second voltage output and said voltage gain stage, for supplying to said voltage gain stage a current which varies in proportion to voltage variations at said first voltage output to effectively increase said output impedance of said voltage gain stage.

4,560,949

HIGH SPEED AGC CIRCUIT

James P. Young, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

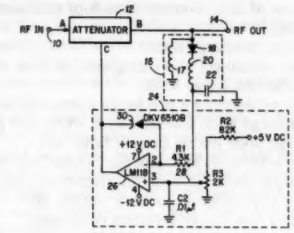
Filed Sep. 27, 1982, Ser. No. 423,762

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—284 **11 Claims**

1. An apparatus for use in an automatic gain control circuit comprising:

an operational amplifier having first and second input terminals and an output terminal; and



a varactor diode electrically coupled between said output terminal and one of said input terminals.

4,560,950

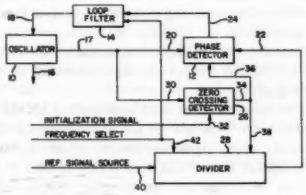
METHOD AND CIRCUIT FOR PHASE LOCK LOOP INITIALIZATION

Richard C. Cabot, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 29, 1983, Ser. No. 537,467

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—1 A **12 Claims**



1. A method for adjusting the frequency of an oscillator relative to the frequency of a reference signal, said method comprising the steps of:

(a) detecting a zero crossing of an output signal from said oscillator;

(b) starting said reference frequency signal at zero initial phase within a predetermined time period following said zero crossing;

(c) comparing the phase of said oscillator output signal to the phase of said reference signal and producing from such comparison an error signal representative of the phase difference between said oscillator output signal and said reference signal; and

(d) adjusting the oscillator frequency based on said error signal, thereby to minimize any phase difference between said oscillator output signal and said reference signal.

4,560,951

VOLTAGE-CONTROLLED OSCILLATOR WITH SURFACE-WAVE TRANSMISSION LINE

Augustin Fütterer, Eching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

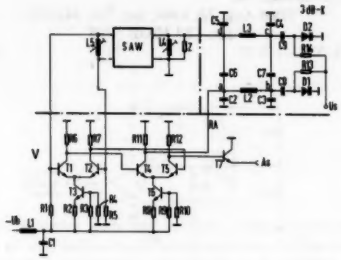
Filed Feb. 2, 1984, Ser. No. 576,297

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305453

Int. Cl.⁴ H03B *5/32*

U.S. Cl. 331—107 A **11 Claims**

1. In a voltage-controlled oscillator with an amplifier and a feedback network having variable capacitance diodes, the improvement comprising the feedback network including a surface-wave transmission line with a pass band corresponding to the desired oscillator frequency connected in a series with a 3dB-90° coupler, and two variable capacitance diodes con-



nected through coupling capacitors with two terminals of the 3dB-90° coupler that are not used as input or output terminals.

4,560,952

CAVITY-STABILIZED MICROWAVE OSCILLATOR

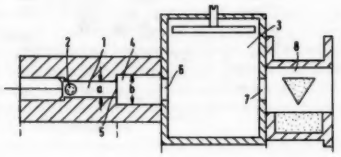
Othmar Tegel, and Hardial S. Gill, both of Backnang, Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,445

Claims priority, application European Pat. Off., Feb. 23, 1983, EP831017231

Int. Cl.⁴ H03B *7/12*

U.S. Cl. 331—107 DP **9 Claims**



1. A stabilized microwave oscillator having a selected operating frequency range, comprising:

a rectangular waveguide dimensioned to have a cutoff frequency above the selected operating frequency range;

at least one active semiconductor element and means connected for supplying a direct operating voltage to said element, mounted in said rectangular waveguide;

means defining a transmission resonator;

coupling means coupling said rectangular waveguide to said resonator, said coupling means comprising a waveguide section having a length of about $\lambda/2$, where λ is the wavelength of the center frequency of the operating frequency range, and said waveguide section being dimensioned so that at least part of said waveguide section operates as an evanescent mode waveguide; and

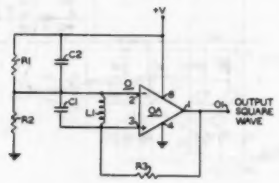
means mounting said semiconductor element in said rectangular waveguide; and

wherein said element and said mounting means together constitute switching means for causing said rectangular waveguide to exhibit plural circuit resonance behavior with subcritical coupling.

4,560,953
FAIL-SAFE SQUARE-WAVE OSCILLATOR

Robert P. Bozio, Penn Hills, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Aug. 20, 1984, Ser. No. 642,453
Int. Cl.[4] H03B 5/08
U.S. Cl. 331—108 D 10 Claims

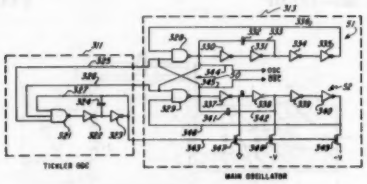


1. A vital oscillating circuit comprising, an operational amplifier having an inverting and a noninverting input terminal and an output terminal, a voltage dividing network for providing a reference voltage at one-half the voltage of a voltage supply source to said inverting input terminal, a resonant circuit for determining the frequency of oscillation coupled between said inverting and noninverting input terminals, a starting capacitor for providing a pulse of current when the voltage source is initially applied to start oscillation, and a feedback circuit coupled between said output terminal and said noninverting input terminal for sustaining oscillation.

4,560,954
LOW POWER OSCILLATOR CIRCUIT

Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1981, Ser. No. 334,487
Int. Cl.[4] H03B 5/12
U.S. Cl. 331—108 B 2 Claims



1. A digital oscillator, comprising:

first and second oscillator loops, each including a logical combination gate within the loop, a plurality of low power inverters connected in cascade from a first low power inverter to a last low power inverter, and a feedback capacitor connected from an output of a second inverter of said plurality of the low power inverter inverters to an input of the first low power inverter the output of a last member of said plurality of low power inverters being connected to a first input of said logical combination gate;

first and second connection means where the first connection means being for connecting the output of the logical combination gate of the first oscillator loop to the input of the first low power inverter means of the first oscillator loop and to a second input of the logical combination gate of the second oscillator loop and wherein the second connection means being for connecting the output of the logical combination gate of the second oscillator loop to the input of the first low power inverter means of the second oscillator loop and to a second input of the logical combination gate of the first oscillator loop such that the logical combination gates of said first and second oscillator loops being connected together to form a bistable multivibrator to produce alternate pulses of oscillator output signals at respective outputs of said logical combination gates;

at least one of said inverters in each of said oscillator loops including;

a precharge/discharge node;

means for selectively preventing current flow through said precharge/discharge node;

means for establishing a precharge voltage on said precharge/discharge node during a time when said precharge/discharge node has no current flow, and

means for selectively allowing the current flow through said precharge/discharge node for discharging said precharge voltage to produce an inverter output; and

each of said low power inverters comprises:

a first, second and third MOSFET device connected in series from the first to third MOSFET devices in a first circuit,

the control elements of a first and second of said MOSFET devices being connected to receive respective first and second out of phase clock pulses;

a capacitor connected between the control element of the second MOSFET device and a node at an interconnection between said first and second MOSFET devices said node being said precharge/discharge node;

said third MOSFET device having its control element connected to receive an input signal;

at least three MOSFET devices connected in series in a second circuit;

the control element of an outside one of said at least three MOSFET devices being connected to said precharge/discharge node;

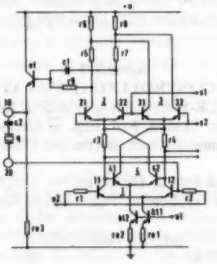
the control element of the other outside one of said at least three MOSFET devices being connected to receive the input signal;

the control element of at least one central MOSFET device of said at least three MOSFET devices being connected to receive the clock signal connected to said control element of said MOSFET in said first series circuit to which said capacitor is connected, an inverter output being developed at an interconnection between said at least one central MOSFET device and the other outside one of said at least three MOSFET devices.

4,560,955
MONOLITHIC INTEGRATED TRANSISTOR HF CRYSTAL OSCILLATOR CIRCUIT

Wolfgang Sauer, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 27, 1984, Ser. No. 634,960
Claims priority, application European Pat. Off., Jul. 29, 1983, 83107491.9
Int. Cl.[4] H03B 5/36
U.S. Cl. 331—116 R 1 Claim



1. In a monolithic integrated transistor HF crystal oscillator circuit comprising:

a crystal;
an amplifier section including a first differential amplifier, a first constant current transistor in the emitter circuit of said first differential amplifier;
a phase shifting section including second and third differential amplifiers and a first capacitor;
an emitter follower; and
circuit means coupling the output of said emitter follower to said crystal;
said first differential amplifier comprising first and second transistors, the base electrode of said first transistor being connected via a first resistor to a constant potential, the base electrode of said second transistor being connected to said constant potential via a second resistor, and said crystal being connected to said base electrode of said second transistor;
said second differential amplifier including third and fourth transistors having their emitters connected in common and coupled via a third resistor to the collector of said first transistor;
said third differential amplifier including fifth and sixth transistors having their emitters connected in common and coupled via a fourth resistor to the collector of said second transistor;
first and second output terminals coupled respectively to the collector of said first and second transistors for providing a sinusoidal output signal;
fifth and sixth resistors serially connected between a potential source and the collector of said third transistor, the collector of said fifth transistor being connected to the junction of said fifth and sixth resistors;
seventh and eighth resistors serially connected between said potential source and the collector of said fourth transistor, the collector of said sixth transistor being connected to the junction of said seventh and eighth resistors;
said first capacitor coupling the collector of said fourth transistor to the input of said emitter follower;
a ninth resistor coupling the collector of said third transistor and said emitter follower input;
the base of said third transistor being coupled to the base of said sixth transistor;
the base of said fourth transistor being coupled to the base of said fifth transistor;
a fourth differential amplifier in said amplifier section comprising seventh and eighth transistors, the base of said seventh transistor being coupled to the collector of said first transistor, the base of said eighth transistor being coupled to the collector of said second transistor, the collector of said seventh transistor being coupled to the emitters of said fifth and sixth transistors, the collector of said eighth transistor being coupled to the emitters of said third and fourth transistors; and
a second constant current transistor coupled to the emitters of said seventh and eighth transistors, the bases of said first and second constant current transistors being coupled to a constant potential.

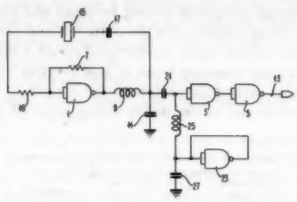
4,560,956

OSCILLATOR WITH CRYSTAL-RESISTIVE FEEDBACK

William S. Duncan, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 26, 1983, Ser. No. 536,117
Int. Cl.⁴ H03B *5/32*
U.S. Cl. 331—116 R **6 Claims**

1. An oscillator comprising a substantially fixed-gain logic gate having an input and an output, a first resistor connected between said input and said output of said logic gate, an inductor having a first side and a second side, said first side of said inductor being connected to said output of said logic gate, a capacitor having a first side and second side, said first side of said capacitor being connected to said second side of said inductor, the second side of said capacitor being connected to a source of reference potential, a frequency-control crystal having a first side and a second side, said first side of said crystal being connected to the junction of said inductor and said capacitor, and the second side of said crystal being connected to said input of said logic gate, and a second resistor



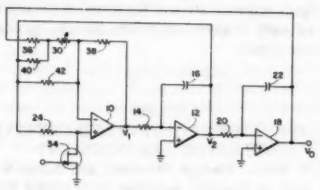
connected in series with said crystal, in circuit between the junction of said inductor and said capacitor and the input of said logic gate, said second resistor being in addition to any resistance of said crystal.

4,560,957

OSCILLATOR FINE TUNE CIRCUIT

Richard C. Cabot, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 29, 1983, Ser. No. 537,310
Int. Cl.⁴ H03B *5/24*; H03F *1/34*
U.S. Cl. 331—135 **4 Claims**



1. A fine tune circuit for use in a state variable oscillator having a first stage comprising an amplifier, a feedback resistor R_f connected between the amplifier output and an inverting input thereof, a variable resistor R_v connected between said inverting input and a first node, said variable resistor controlling the frequency of said oscillator, and a resistor connected between a non-inverting in put of said amplifier and a second node, a second, integrating stage, and a third, integrating stage, said circuit comprising:

(a) a resistor R_i connected between said first node and a third node;

(b) a resistor R_n connected between said first and second nodes; and

(c) a resistor R_m connected between said inverting input and said second node,

feedback from said second stage being applied to said second node and feedback from said third stage being applied to said third node.

4,560,958

STATE VARIABLE OSCILLATOR HAVING IMPROVED REJECTION OF LEVELER-INDUCED DISTORTION

Bruce E. Hofer, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 24, 1984, Ser. No. 583,510
Int. Cl.⁴ H03B *5/20*
U.S. Cl. 331—135 **5 Claims**

1. A state variable oscillator comprising:

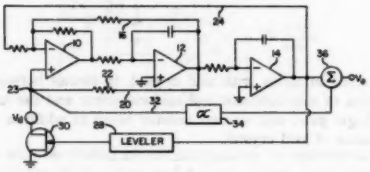
(a) an inverter amplifier having an inverting input, a noninverting input and an output;

(b) a first integrator having an input and an output, the input being connected to the output of said inverter amplifier, and the output being connected through a first feedback

path to the inverting input of said inverter amplifier and through a second feedback path to the noninverting input thereof;

(c) a second integrator having an input and an output, the input being connected to the output of said first integrator, and the output being connected through a third feedback path to the inverting input of said inverter amplifier;

(d) leveler means connected to the output of said second integrator and to the noninverting input of said inverter



amplifier for varying the gain of said inverter amplifier in response to the output amplitude of said second integrator; and

(e) feedforward means connected to the noninverting input of said inverter amplifier and to the output of said second integrator for adding to the output of said second integrator a signal representative of the signal at the noninverting input of said inverter amplifier, thereby producing an oscillator output.

4,560,959

TEMPERATURE CONTROLLED CRYSTAL OSCILLATOR ARRANGEMENT

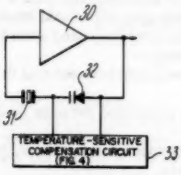
George H. S. Rokos, Bishops Stortford, and James S. Wilson, Harlow, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

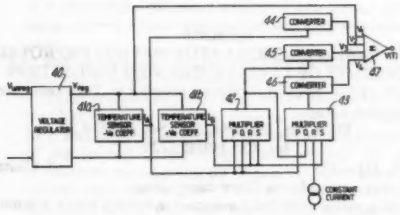
Filed May 18, 1983, Ser. No. 495,858

Claims priority, application United Kingdom, May 18, 1982, 8214417

Int. Cl.[4] H03L *1/02*

U.S. Cl. 331—176 **15 Claims**





1. A temperature compensated crystal oscillator arrangement, comprising

a crystal oscillator circuit including an oscillator crystal and having a frequency selective positive feedback path incorporating a frequency pulling control element; and

a temperature sensitive compensation circuit so connected to said feedback path as to drive said control element and including

temperature sensing means operative for issuing an electrical output signal that is a monotonically varying function of temperature,

power series function generator means connected to said temperature sensing means to receive said output signal therefrom and operative for generating a series of outputs that represent the terms of a Chebyshev-like polynomial function, the orders of the terms increasing from zero to the number of outputs less one,

summing amplifier means having a plurality of inputs each receiving one of said outputs of said power series function generator means and operative for providing an output signal that is a weighted sum of said outputs of said power series function generator means, and

means for applying said output of said summing amplifier means to said feedback path so as to drive said control element.

4,560,960

DIGITAL FREQUENCY SYNTHESIZER FOR GENERATING A FREQUENCY-MODULATED SIGNAL AND RADIO FREQUENCY APPARATUS INCLUDING SUCH A DEVICE

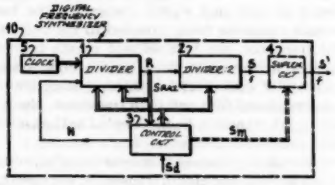
Jean C. Chanrion, Paris, France, assignor to Thomson CSF, Paris, France

Filed Feb. 24, 1983, Ser. No. 469,436

Claims priority, application France, Mar. 5, 1982, 82 03733

Int. Cl.[4] H03B *19/00*

U.S. Cl. 331—178 **15 Claims**



1. Digital frequency synthesizer apparatus for generating a frequency modulated output signal S, comprising:

clock means for providing a clock signal having a frequency f_H and a period $T = 1/f_H$;

programmable divider means, connected to said clock means, for receiving said clock signal and generating a pulse signal R which has a variable cycle equal to NT (where N is a whole integer which can take any value from 0 to n) and a pulse width equal to T;

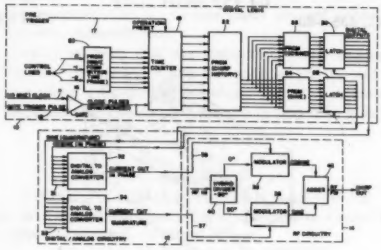
shaping means, connected to said programmable divider means, for receiving said pulse signal R and producing said output signal S which has a half-cycle corresponding to said pulse signal cycle; and

control means, connected to said programmable divider means and to said shaping means and adapted to receive a control signal S_d, for successively supplying the values of N to said programmable divider means in accordance with said control signal S_d so that said output signal S is frequency modulated according to a sequence of values of N.

4,560,961
METHOD AND MEANS FOR GENERATING PULSE COMPRESSION PULSES

William W. Kestenbaum, Lido Beach, N.Y., assignor to Republic Electronics, Inc., Melville, N.Y.

Filed Jan. 26, 1983, Ser. No. 461,118
Int. Cl.⁴ H03C 3/00
U.S. Cl. 332—23 A 10 Claims



1. A system for producing a phase and frequency modulated signal corresponding in frequency and phase to a phase history of a desired signal comprising:

a digital means for producing two digital components representing respectively sine and cosine functions corresponding to a phase angle of said phase history of said desired signal;

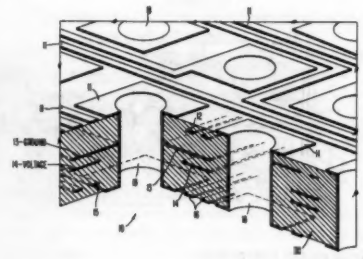
a digital-to-analog circuit arranged to receive said digital components and to translate the same into two analog currents respectively corresponding to said sine and cosine functions; and

an analog circuit arranged to modulate RF signals in response to said two analog currents and to add the modulated RF signals to produce a constant amplitude signal having a frequency and phase corresponding to said desired signal.

4,560,962
MULTILAYERED PRINTED CIRCUIT BOARD WITH CONTROLLED 100 OHM IMPEDANCE

Michael Barrow, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 30, 1983, Ser. No. 527,840
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.⁴ H01P 5/12
U.S. Cl. 333—1 2 Claims



1. In a printed circuit board of less than 69 mils overall thickness having six planes of conductive layers wherein each layer is separated by an epoxy glass substrate with a dielectric constant of 4.2–5.0, the combination comprising:

(a) a central dielectric epoxy glass substrate of 5 mils thickness which is overlaid by an upper central and a lower central conductive copper plane;

(b) said upper central and said lower central conductive copper planes having a thickness of 1.4 mils and being respectively contiguous to a first internal upper epoxy glass dielectric substrate and a first internal lower epoxy glass dielectric substrate;

(c) said first internal upper epoxy glass substrate and said first internal lower epoxy glass substrate each having a thickness of 25 mils;

(d) an upper and a lower internal plane of microstrip transmission lines contiguous to said first internal upper and said first internal lower epoxy glass substrates, said upper and lower internal microstrip transmission lines, each line having a width/thickness ratio of 5 mils/0.7 mil and wherein said upper internal microstrip transmission lines run at right angles to said lower internal microstrip transmission lines;

(e) a second internal upper and a second internal lower epoxy glass substrate having a 3 mil thickness and resting contiguous to said respective upper and lower internal plane of microstrip transmission lines;

(f) an upper outer plane of microstrip transmission lines and a lower outer plane of microstrip transmission lines, each line having a width/thickness ratio of 8 mils/1.4 mils, and wherein said upper outer plane and lower outer plane of microstrip transmission lines reside respectively contiguous to said second internal upper and lower epoxy glass substrates, and said upper outer plane of transmission lines run at right angles to said lower outer plane of transmission lines;

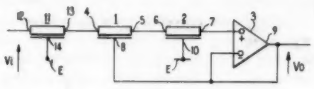
(g) a plurality of conductive land areas having central apertures for connection of component leads, said conductive land areas having connection to selected transmission lines and/or said central conductive copper planes;

(h) and wherein the characteristic impedance between any microstrip transmission line and said central conductive copper planes is 100 ohms ±10%.

4,560,963
ANALOG RC ACTIVE FILTER

Robin Sharpe, Carshalton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,830
Claims priority, application United Kingdom, Feb. 22, 1983, 8304891
Int. Cl.⁴ H03H 11/08, 7/06
U.S. Cl. 333—172 5 Claims



1. An analog wave filter device comprising an active device and first and second RC filter elements each providing a series resistance and a shunt capacitance, each filter element having first and second connection points between which its series resistance is defined and a third connection point for the shunt capacitance, the first connection point of the first filter element serving as an input of the filter device, the second connection point of the first filter element being connected to the first connection point of the second filter element, the second connection point of the second filter element being connected to an input of the active device, the third connection point of the first filter element being connected to an output of the active device, and the third connection point of the second filter element being connected to ground, which filter device has an integrated operational amplifier as its active device and has its first and second RC filter elements in integrated distributed form, and which filter device is characterized by comprising a

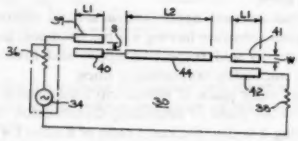
third RC filter element which is of the same distributed form as the first and second filter elements and which has its second connection point connected to the first connection point of the first filter element and its third connection point connected to ground, the first connection point of the third filter element forming the input of the filter device.

4,560,964

COMPACT STEP TUNED FILTER

Paul J. Meier, Westbury, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 28, 1985, Ser. No. 706,730
Int. Cl.[4] H01P *1/203, 7/08*
U.S. Cl. 333—202 **6 Claims**



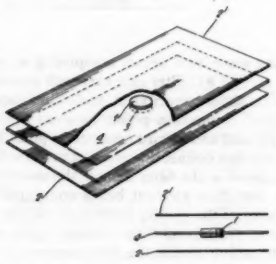
1. A microwave frequency filter comprising in combination:
an input set of parallel coupled transmission lines providing a lumped element capacitor at one frequency and a matched transmission line at another frequency;
an output set of parallel coupled transmission lines providing a lumped element capacitor at said one freqency and a matched transmission line at said other frequency; and
a central transmission line connected between said input and output sets of coupled lines and providing a resonator between said lumped element capacitors at said one frequency and a matched transmission line at said other frequency.

4,560,965

MOUNTING DIELECTRIC RESONATORS

Ian G. Gosling, Ipswich, and Richard D. Carver, Felixstowe, both of England, assignors to British Telecommunications plc, London, England

Filed Nov. 16, 1984, Ser. No. 672,235
Claims priority, application United Kingdom, Nov. 21, 1983, 8331051
Int. Cl.[4] H01P *7/00, 7/04, 1/207*
U.S. Cl. 333—219 **12 Claims**



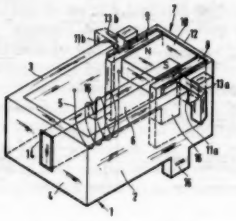
1. A dielectric resonator mount having a laminar structure which comprises a polymeric support layer between two polymeric retaining layers wherein the support layer includes an aperture within which is located a dielectric resonator.

4,560,966

POLARIZED ELECTROMAGNET AND POLARIZED ELECTROMAGNETIC RELAY

Mitsuki Nagamoto, Mie, and Ikuo Hashiya, Osaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Japan and SDS-Relais AG, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,382
Claims priority, application Japan, Jun. 30, 1983, 58-102053[U]; Jun. 30, 1983, 58-102054[U]
Int. Cl.[4] H01H *51/72*
U.S. Cl. 335—80 **11 Claims**



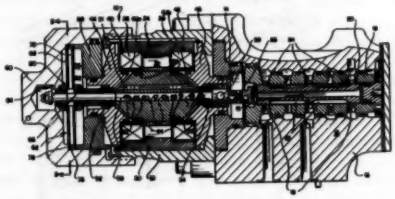
1. A polarized electromagnet comprising
a generally E-shaped yoke including a pair of outer legs, a magnetically active intermediate leg disposed between the outer legs and carrying a coil, and a base portion interconnecting these three legs,
a generally U-shaped armature including a pair of legs interconnected by a magnetically active base portion including a permanent magnet,
said armature being positioned so that each of its legs extends between, and substantially parallel to, the intermediate leg and a respective one of the outer legs of said yoke,
said armature being movable relative to said yoke in a direction transverse to the direction along which all of said legs extend, and
wherein the outer legs of said yoke are provided with guide slots and said armature is inserted in a member of nonmagnetic material provided with portions projecting outwardly in opposite directions and slidably engaging said guide slots.

4,560,967

FORCE MOTOR

Charles T. Lindsey, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 4, 1984, Ser. No. 596,490
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—262 **7 Claims**



1. A force motor comprising:
a casing;
first and second pole pieces arranged on opposite ends of said casing;
a magnetic assembly located within said casing and between said pole pieces, said magnetic assembly including a permanent magnet and one or more electrical coils;

an armature that is movable between said pole pieces in response to an input signal to said magnetic assembly;

a spring assembly having at least one cantilevered spring, said spring assembly being connected to said armature and opposing movement of said armature from a reference position, the opposing force of said spring assembly when said armature is out of said reference position being greater than the force of the permanent magnet of the magnetic assembly with no input current to the coils;

a tube assembly that is concentrically sleeved within said magnetic assembly; and

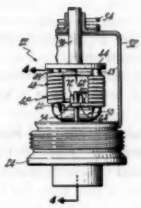
a plurality of balls that are circumferentially maintained between the armature and the tube assembly, said balls contacting both the armature and the tube assembly to longitudinally guide said armature in said tube assembly.

4,560,968

MAGNETIC ACTUATOR FOR A GAS VALVE

Ronald W. Gagnon, Cromwell, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 25, 1984, Ser. No. 664,630
Int. Cl.⁴ H01F *7/08*
U.S. Cl. 335—281 **9 Claims**



1. A magnetic actuator for a gas valve comprised of a body; a U-shaped magnet mounted at its U-base on the body; an electrical coil winding around the U-legs of the magnet, electrically connected at a first coil end with the body and at a second coil end with an electrically isolated center pin passing through both the body and the U-base of the magnet; characterized by a C-shaped insulator embracing the U-base of the magnet to insulate both the face of the magnet which contacts the base and the opposing face thereof; and, means which retain the insulator on the magnet prior to its being mounted on the base.

4,560,969

ELECTROMAGNETIC POSITIONER FOR A SERVOVALVE OR THE LIKE

Robert D. Nicholson, Birmingham, Mich., assignor to Bardle Servovalve Company, Birmingham, Mich.

Filed Dec. 1, 1983, Ser. No. 557,360
Int. Cl.⁴ H01F *7/14*
U.S. Cl. 335—272 **5 Claims**

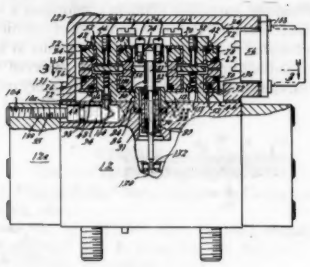
1. An electromagnetic positioner for a servovalve, or the like, comprising

selectively energizable magnetic means,

a magnetizable armature positioned for pivotal movement in response to magnetic force exerted thereon by said magnetic means,

a flexure tube fixedly supported at its lower end and projecting upwardly to a position in which the upper end thereof is above said armature,

a drive arm, and means for supporting said armature for movement about a horizontal axis adjacent but above the center of rotation of said drive arm, said means including an upwardly extending adapter secured at its lower end to the armature,



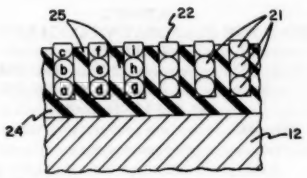
and means for securing the upper ends of the drive arm and of the flexure tube to the upper end of said adapter.

4,560,970

VARIABLE TRANSFORMER WITH MULTI-LAYER COIL

Richard S. Lenzing, Farmington, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Sep. 7, 1984, Ser. No. 648,481
Int. Cl.⁴ H01F *21/02, 29/06, 41/06*
U.S. Cl. 336—149 **3 Claims**



1. In a variable transformer of the type having a coil of successive turns of wire wound upon a core, with a commutating surface on the face of the coil with which a movable brush is in electrical engagement, an end form comprising:

a. a first portion of the end form which insulates the core from the coil;

b. a second portion of the end form which comprises a row of partitions substantially under the commutating surface, the interspaces of which partitions are essentially equal to diameter of the wire, and which partitions are of such height and orientation that a plurality of successive turns of the coil are held in each interspace, with sections of the topmost turns of wire comprising the commutating surface and all of the turns, including the turns forming the commutating surface, being between the partitions.

4,560,971

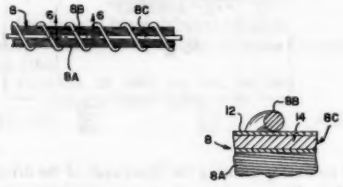
SPIRAL WOUND SHUNT TYPE SLOW BLOW FUSE

Seibang Oh, Elk Grove Village, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Sep. 10, 1984, Ser. No. 648,175
Int. Cl.⁴ H01H *85/04*
U.S. Cl. 337—164 **15 Claims**

1. In a slow blow fuse which includes a pair of spaced terminals between which is connected and suspended a fuse wire assembly, said fuse wire assembly including a core of insulating material having a spirally wound fuse filament wrapped a number of times around said core, the improvement comprising a second fuse filament on said core unit wherein said spirally wound fuse filament makes repeated axially spaced physi-

cal and electrical contact with said second fuse filament, so that at least two fuse filaments cross and are in electrical parallel circuit connection and cross at a number of different locations therealong, each fuse filament comprising a body of base metal which will melt instantly under short circuit current and is to melt under prolonged overload currents at least when a melting temperature lowering tinning material or the like initially on the outside thereof has progressively migrated to an



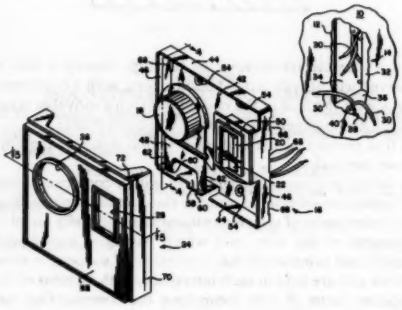
effective degree into the base metal body of said fuse filaments, and there being only a single active layer of said tinning material or the like contacting the outer margins of the base metal of said fuse filaments along the length thereof where it can migrate into both of the same, so that said single layer of tinning material or the like is shared at said contact locations where the tin can migrate into both fuse filaments at these points under overload current conditions.

4,560,972

HOUSING FOR EVAPORATIVE COOLER CONTROL DEVICE

Paul E. Britt, 5420 LaEstancia, El Paso, Tex. 79932

Filed Jan. 12, 1983, Ser. No. 457,357
Int. Cl.[4] H01H *37/52*
U.S. Cl. 337—338 **12 Claims**



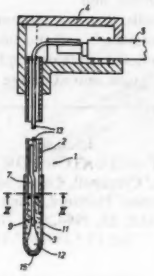
1. A switch housing comprising: a base panel including a pair of opposed side panels that extend outwardly from said base panel, means for securing said base panel to a supporting surface, said base panel including first switch positioning means for positioning first switch means on a surface of said base panel second switch positioning means extending from one of said side panels carried by said base panel and spaced laterally from said first switch positioning means and outwardly from the surface of said base panel for positioning second switch means, said second switch positioning means including a substantially planar mounting bracket spaced outwardly from and substantially parallel to said base panel and integral with said one of said side panels, said second switch positioning means having an opening to receive and support said second switch means, and cover means removably attached to said base panel to define an enclosure therewith for housing said second switch means.

4,560,973

ROD SHAPED THERMOMETER AND METHOD OF MAKING SAME

Hermann Grimm, Ostelsheim; Wolfgang Volz, Magstadt; Ottmar Supper, Rottenburg, and Martin Pfeiffer, Stuttgart-Moehringen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,896
Int. Cl.[4] G01K *1/16, 7/18*
U.S. Cl. 338—28 **7 Claims**



1. A rod shaped thermometer for detecting the temperature in a heat exchanger comprising:

a temperature sensing resistance with a pair of leads attached thereto, each said lead having a free end opposite the resistance,

a tube having a tubular inside wall and web means integral with said inside tubular wall for forming two channels within said tube, said free ends of said leads extending into respective channels of said tube for connection with measuring device lines,

cap means connected to the tube for accommodating the resistance, and

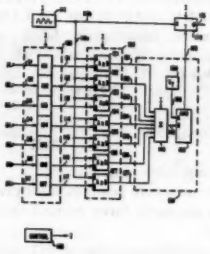
means for providing an enhanced thermal conductivity path between the cap means and the resistance.

4,560,974

REAL-TIME ORDINAL-VALUE FILTER UTILIZING REFERENCE-FUNCTION COMPARISON

Guy B. Coleman, Northridge; James W. Henderson, Woodland Hills, and Jacob M. Sacks, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 306,256, Sep. 28, 1981, abandoned. This application Jan. 30, 1984, Ser. No. 575,107
Int. Cl.[4] G06F *7/06;* **G06K** *9/00*
U.S. Cl. 340—146.2 **8 Claims**



3. Apparatus for generating a signal which closely approximates the Mth-largest of a set of R applied data signals, where the possible values of said applied signals can extend over a total interval T, this apparatus comprising:

(A) input storage means, for receiving and storing the subject set of R signals;

(B) reference-generator means, for providing a reference signal whose values monotonically scan over said total interval T, with at least one such scan occurring for each data set applied, where said values scan from the lower end of said interval T to the interval's higher end;

(C) a plurality of R reference-comparison means, all of said reference-comparison means receiving said reference signal, and each of said comparison means receiving a single and mutually-different one of said data signals,
each of said comparison means generating a comparison-output signal whenever the value of said reference signal has become equal to or has scanned past the value of the associated one data signal, where all of said output signals are of equal magnitude;

(D) summation means, having a sum value initialized at zero before the value scan of said reference signal, and responsive to all of said commparison-output signals,
said summation means forming and storing, each time a comparison output is generated, a new sum value by adding each generated one of said comparison signals to the last-formed sum;

(E) selectable-threshold-generator means, for producing a rank-count threshold signal indicative of the ranking quantity (R−M+1);

(F) threshold-comparison means, responsive to said sum value and to said rank-count threshold signal,
said threshold means generating a trigger signal when said sum value reaches said rank-count threshold signal; and

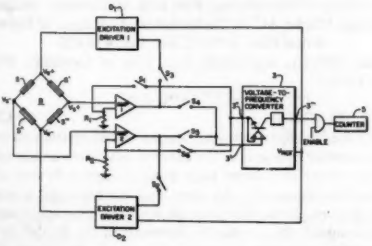
(G) sampler means, responsive to said trigger signal and to said reference signal,
for sampling said reference signal and for storing and outputting an ordinal-output signal corresponding to the value produced by said reference-generator means at the time when said sum value reaches said rank-count threshold signal;

whereby said ordinal-output signal closely-approximates that particular input data value which is the Mth-largest of the R applied values.

4,560,975
METHOD OF AND APPARATUS FOR ERROR COMPENSATION IN ELECTRONIC ANALOG SENSING SYSTEMS AND THE LIKE

Curt Jarva, Hanover, Mass., assignor to Indata Corporation, W. Concord, Mass.

Filed Mar. 22, 1982, Ser. No. 360,209
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 CC **4 Claims**

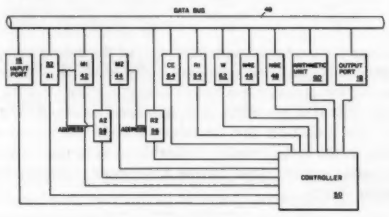


1. Apparatus for analog sensing and electronic conversion to digital signals with electronic circuit error compensation having, in combination, electric signal-producing sensor means; driver means for exciting the sensor means; operational amplifier means connected to receive the output of the sensor means; analog-to-digital conversion means comprising voltage-to-frequency converter means connected to the operational amplifier means to produce an output frequency signal in response to an amplified sensor signal; feedback connections amongst and embracing all of the converter means, the amplifier means, and the driver means; and switching means for causing feedback signals along said feedback connections to compensate for operational errors in said driver and converter means and isolate the output frequency signal of the converter means from any errors except offset errors and the like of the amplifier means; and means for cancelling out said amplifier means errors in said converter output frequency signal.

4,560,976
DATA COMPRESSION

Steven G. Finn, Framingham, Mass., assignor to Codex Corporation, Mansfield, Mass.

Continuation of Ser. No. 311,744, Oct. 15, 1981, abandoned.
This application Jun. 5, 1984, Ser. No. 617,241
Int. Cl.⁴ H03K *13/24*
U.S. Cl. 340—347 DD **3 Claims**



1. Apparatus for encoding a stream of source characters into a stream of codewords, each of said source characters having a potentially time-varying frequency of appearance in said stream of source characters, each of said codewords belonging to one of a plurality of groups of said cordwords, said codewords in said respective groups comprising respectively different numbers of subwords, said apparatus comprising:

an encoder for encoding each of said source characters as one of said codewords, such that source characters which are encoded as codewords having fewer subwords have a frequency of appearance at least as great as source characters which are encoded as codewords having more subwords, and

a group size selector for changing to new numbers the numbers of codewords belonging respectively to fewer than all of said groups, and resetting the numbers of codewords belonging to the other said groups based upon said new numbers, whereby at least a portion of said stream of codewords is shortened.

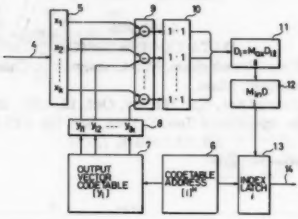
4,560,977
VECTOR QUANTIZER

Tokuichi Murakami, and Kohtaro Asai, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,474
Claims priority, application Japan, Jun. 11, 1982, 57-100516; Oct. 26, 1982, 57-187906
Int. Cl.⁴ G06G *7/00*
U.S. Cl. 340—347 AD **3 Claims**

1. A vector quantizer, comprising; an output vector codetable for partitioning a K-dimensional Euclidean signal space having an input vector consisted of K input samples (K being an integer larger than 1) to provide subspace having minimum distorted partitions with respect to the probability density of said input samples and for storing the representative output vectors of said subspaces; a subtractor for calculating the difference between the output vectors successively read from said codetable and said input vectors with respect to the individual components thereof; an absolute value corrector for

converting each component of the output of said subtractor into an absolute value for determining the distortion of each element; a maximum element distortion detector for determining the distortion of each element; a maximum element distortion detector for determining a maximum distortion by comparing the distortions of the respective components; a least distorted output vector detector for detecting an output vector



having the least maximum distortion of the output components successively collated with said input vector; a coding output circuit for outputting a coded address of said output vector codetable that corresponds to said least distorted output vector; and a decoder that decodes the coded output of said address in the output vector codetable so as to read out a corresponding vector output having a minimum distortion from the intput vector.

4,560,978

COMMUNICATION SYSTEM AND METHOD

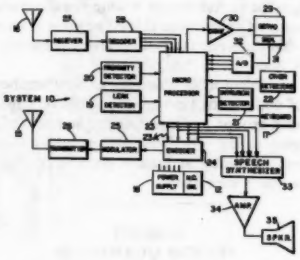
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Division of Ser. No. 110,542, Jan. 8, 1980, abandoned. This application Jun. 19, 1984, Ser. No. 622,109

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] G08B *1/08, 21/00*

U.S. Cl. 340—539 **6 Claims**



1. A communication system comprising:

a monitor station having signal transmitting and receiving means,

a portable monitoring device having signal generating and transmitting means and signal receiving means,

a plurality of sensors remote from said monitor station and said portable monitoring device,

means associated with each sensor operable to generate a different code when the sensor senses a variable condition and means for transmitting said codes to said receiving means of said monitor station,

means at said monitor station for generating coded electrical signals on the output of said receiving means defining the information received from said sensors,

means at said monitor station for computer analyzing the signals generated on the output of said receiving means and generating speech signals indicative of the conditions sensed, and

means for transmitting said speech signals to said receiving means of said portable device, and

means at said portable device for transducing the speech signals received by said receiving means to sounds of words of speech which intelligibly indicate the conditions sensed by said sensors.

4,560,979

METHOD FOR TRIGGERING AN ALARM IN AN INFUSION SYRINGE

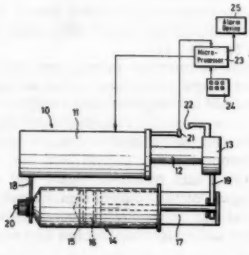
Gerhard Rosskopf, Fuldabrück-Dörnhagen, Fed. Rep. of Germany, assignor to Intermedicat GmbH, Emmenbrücke, Switzerland

Filed Mar. 20, 1984, Ser. No. 591,558

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314664

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—540 **2 Claims**



1. A method for triggering an alarm in an infusion syringe pump of the type having a slide displaced to force infusion liquid out of a syringe and a sensor activated by the slide before reaching its end position, comprising calculating the residual infusion time upon activation of the sensor from the residual volume in the infusion syringe and the infusion rate, and providing an alarm a predetermined time before expiration of the residual infusion time.

4,560,980

METHOD OF TYPING SCRIPTS WHOSE CHARACTERS ARE ARRANGED NEXT TO ONE ANOTHER IN ROWS OR UNDERNEATH ONE ANOTHER IN COLUMNS

Peter Tillich, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,493

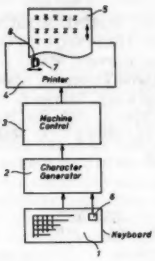
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148684

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—727 **12 Claims**

1. In a method for displaying scripts whose characters can be arranged either one next to the other in row lines or one underneath the other in column lines using a display device which displays characters line by line and a character generator which derives, from the data of a stored character supply, actuation signals for the display elements of the display device, said method including the steps of deriving, by means of the character generator and in response to an input signal corresponding to a desired character, actuation signals for the display device representative of the desired character, and displaying the desired characters at desired positions in a display line on a display medium in response to said actuation signals; the improvement comprising: providing a first selectable mode of operation of said character generator wherein said actuation signals will cause the desired individual characters of a display line to be displayed upright and next to one another, and a

second selectable mode of operation of said character generator wherein said actuation signals will cause the desired individual characters of a display line to be displayed next to one another but rotated by 90° with respect to the characters in



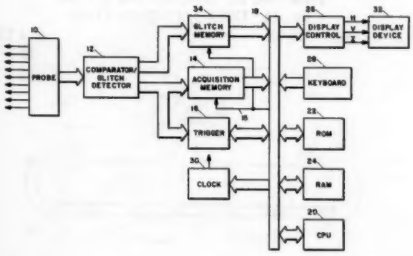
said first mode; and, prior to said step of displaying, selecting one of said first and second modes of operation, whereby the desired characters are displayed next to one another in the same display positions of a display line regardless of the selected mode of operation.

4,560,981

LOGIC WAVEFORM DISPLAY APPARATUS

Ronald M. Jackson; Daniel C. Olin, both of Portland, and Russell Y. Anderson, Hillsboro, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1983, Ser. No. 478,180
Int. Cl.⁴ G06F *3/14*
U.S. Cl. 340—747 **7 Claims**



1. An apparatus for displaying a logic waveform of an input logic signal consisting of digital bits on a raster scan display device, comprising:

delay means for receiving said input logic signal and providing a delayed logic signal; and

addressable memory means containing a predetermined pattern of logical ones and zeros to provide pixel turn-on and turn-off levels, respectively;

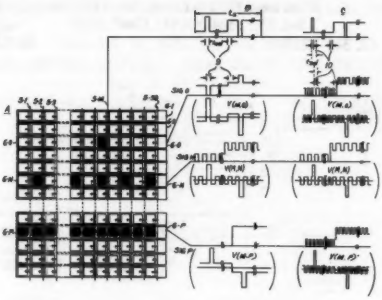
wherein said logical ones and zeros are selected in accordance with said input logic signal, said delayed logic signal, and raster line position information received at the address terminals of said memory means.

4,560,982

DRIVING CIRCUIT FOR LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE

Tomio Sonehara; Masami Murata, and Tadashi Ota, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,753
Claims priority, application Japan, Jul. 31, 1981, 56-121112
Int. Cl.⁴ G09G *3/36*
U.S. Cl. 340—784 **20 Claims**



1. A driver circuit for a liquid crystal display having a liquid crystal panel with overlapping scanning and display electrodes forming a matrix of picture elements at the overlapping intersections of the scanning and display electrodes, the picture elements being defined by opposed portions of the scanning and display electrodes, each of the picture elements in the matrix being selected during a frame period during which each of the picture elements is caused to display an ON or OFF state as a result of a voltage difference between an opposed scanning electrode and an opposed display electrode, a scanning period being defined as the frame period divided by the number of scanning electrodes in the matrix, the driver circuit comprising:

nonlinear driving means associated with each of the scanning and display electrodes for driving the scanning and display electrodes in a nonlinear manner;

scanning electrode signal generating means for supplying a series of scanning signals to the respective nonlinear driving means for application to the scanning electrodes, each scanning signal for one of the scanning electrodes being at a selected level during a frame period for only a portion of one scanning period associated with one of the picture elements defined by the intersection of the one scanning electrode and the display electrodes, the scanning signal for the one scanning electrode being at a non-selected level during the remaining portion of said frame period;

display electrode signal generating means for supplying a display signal train for each of the display electrodes to the respective nonlinear driving means, each display signal train corresponding to one display signal electrode being composed of a series of display signal train segments, each display signal train segment being a scanning period long and corresponding to the scanning period of a picture element formed by the overlapping intersection of the one display electrode and one of the scanning electrodes, each display signal train segment having a first portion at a selected level and a second portion at a non-selected level, the first portion of the signal train segment substantially coinciding with the selected level portion of the scanning signal for the picture element when the picture element is to display an ON state and the second portion of the signal train segment substantially coinciding with the selected level portion of the scanning signal for the picture element when the picture element is to display an OFF state;

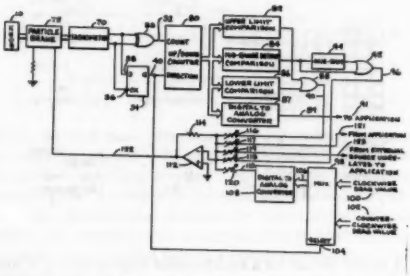
whereby the display of the picture element formed by a display electrode is substantially unaffected by the number of picture elements to display an ON state in a display signal train.

4,560,983

DYNAMICALLY INTERACTIVE RESPONSIVE CONTROL DEVICE AND SYSTEM

Marshall Williams, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 17, 1982, Ser. No. 419,632
Int. Cl.⁴ H04Q *9/00*; G06F *3/02*
U.S. Cl. 340—825 **66 Claims**



1. A control for the input of information to a utilization device to control at least one parameter associated therewith, comprising:

a member positionable over a range and moveable throughout said range for effecting an output response and providing a tactually perceivable sensation in response to movement of said member with resistance to said movement producing a tactually perceivable sensation controllable independent of its position in said range; and

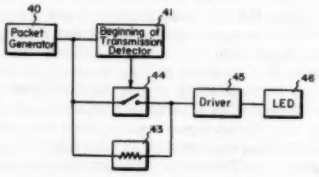
means operatively coupled to said member for generating an indication of the position of said member and direction of movement of said member.

4,560,984

METHOD AND APPARATUS FOR DETECTING THE COLLISION OF DATA PACKETS

Frederick W. Scholl, Riverdale, N.Y., assignor to Codenoll Technology Corporation, Yonkers, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,432
Int. Cl.⁴ H04Q *00/00*
U.S. Cl. 340—825.5 **9 Claims**



3. An apparatus for detecting collisions of packet of binary data comprising:

means for generating in binary data signal packets a collision signal having an amplitude significantly greater than that of a high binary data signal level;

means for transmitting said data signal packets having said collision signal;

means for receiving said data signal packets from said transmitting means; and

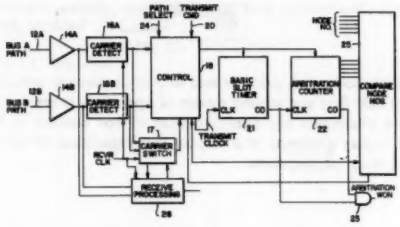
means for producing a packet collision signal whenever two collision signals are received by said signal packet receiving means within a detection period equal to the sum of the duration of a packet and the minimum length of time between packets.

4,560,985

DUAL-COUNT, ROUND-ROBIN DISTRIBUTED ARBITRATION TECHNIQUE FOR SERIAL BUSES

William D. Strecker, Harvard, Mass.; John E. Buzynski, Windham, N.H., and David Thompson, Malden, Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Filed May 7, 1982, Ser. No. 375,983
Int. Cl.⁴ H04Q *9/00*; H04J *15/00*
U.S. Cl. 340—825.5 **13 Claims**



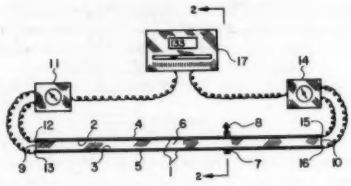
1. In a network for interconnecting a plurality of computer nodes via a bit-serial bus, the improvement comprising arbitration means for controlling access to the bus by ascribing to each node a priority value and permitting access by that node which is requesting access and which has the highest priority value, and wherein the arbitration means assigns priority values such that under conditions of substantial demand for bus access, the average of the priority values is the same for each node.

4,560,986

COMPARATIVE VARIABLE RESISTANCE POSITION INDICATOR

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Filed Jan. 16, 1984, Ser. No. 571,343
Int. Cl.⁴ G08B *5/32*; G01F *23/10*
U.S. Cl. 340—870.38 **4 Claims**



1. A position-sensing device comprising in combination:

(a) a pair of electrically conducting cords disposed parallel to one another in a dielectric support wherein at least one of said pair of electrically conducting cords has a high specific ohmic resistance;

(b) a sliding contact conductor slidable along said pair of electrically conducting cords intermediate two extremities of said pair of electrically conducting cords wherein said sliding contact conductor provides a localized electrical connection between said pair of electrically conducting cords by maintaining an electrically conducting contact with both of said pair of electrically conducting cords;

(c) a first measurement device electrically connected to said pair of electrically conducting cords at substantially one extremity of said pair of electrically conducting cords, said first measurement device including means for measuring electric current flow in and a voltage drop of the electromotive force over a first electric circuit comprising a first portion of said pair of electrically conducting cords intermediate said sliding contact conductor and said one extremity of said pair of electrically conducting cords and said sliding contact conductor;

(d) a second measurement device electrically connected to said pair of electrically conducting cords at substantially the other extremity of said pair of electrically conducting cords opposite to said one extremity, said second measurement device including means for measuring electric current flow in and a voltage drop of the electromotive force over a second electric circuit comprising a second portion of said pair of electrically conducting cords intermediate said sliding contact conductor and said the other extremity of said pair of electrically conducting cords and said sliding contact conductor;

(e) an output device including means for converting information on said electric currents in and drops of said electromotive forces over said first and second electric circuits to information on a relative position of said sliding contact conductor intermediate said one and the other extremities of said pair of electrically conducting cords; and

(f) means for coupling the sliding movement of said sliding contact conductor and a movement of a position marker indicating a position to one another wherein movement of said marker creates sliding movement of said sliding contact conductor;

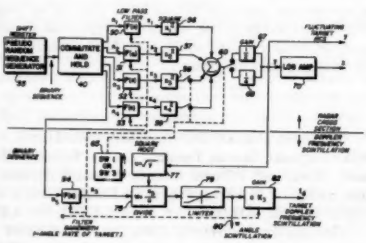
whereby, said information on the relative position of said sliding contact conductor relates to information on the relative positions of said marker.

4,560,987

RADAR TARGET DOPPLER FREQUENCY SCINTILLATION SIMULATOR AND METHOD

Claude Dochow; Mark L. Patterson, and Richard W. Sanneman, all of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1983, Ser. No. 511,068
Int. Cl.[4] G01S *7/40*
U.S. Cl. 343—17.7 **12 Claims**



1. A radar target simulator comprising:

first means for generating a pseudo random signal and commutating the signal onto a plurality of output lines;

filter means connected to each of the plurality of output lines for providing a plurality of Gaussian random variable signals one from each of the signals on each of the plurality of output lines;

second means connected to said filter means for squaring all but one of the plurality of Gaussian random variable signals and combining the squared signals to provide an output signal representative of target power return;

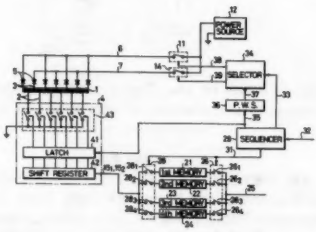
third means connected to said filter means to receive the one unsquared Gaussian random variable signal and connected to said second means to receive the output signal for determining the square root of the received output signal and dividing the received Gaussian random variable signal by the square root to produce an output signal representative of target angle scintillation.

4,560,988

THERMAL HEAD DRIVING METHOD

Haruhiko Moriguchi; Toshiharu Inui, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1982, Ser. No. 399,147
Claims priority, application Japan, Jul. 17, 1981, 56-110766
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—1.1 **5 Claims**



1. In a method for driving a thermal head wherein a plurality of heat generating elements arranged in the thermal head are divided into a predetermined number of blocks and the heat generating elements in the respective blocks are driven at different times to carry out the recordation of one line, the improvement comprising the steps of:

dividing the data for recording one line into at least two parts and storing each said part in a separate memory;

alternatingly reading out said data from said memories into a single shift register, the data for one portion of said line being latched synchronously with the reading out of the data for another portion of said line from the memory therefor; and,

alternately and repeatedly driving the heat generating elements in each block to record one line.

4,560,989

METHOD AND APPARATUS FOR ACCELERATING THE RECORDING RATE OF A CRT GRAPHIC RECORDER

Pierre Radochonski, Lake Oswego; John M. Kniffin, Tualatin; Joern B. Eriksen, Oregon City; Jerrold J. Rogers, Beaverton, and William W. Gellatly, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 23, 1984, Ser. No. 602,889
Int. Cl.[4] G01D *9/00, 9/42*
U.S. Cl. 346—1.1 **11 Claims**

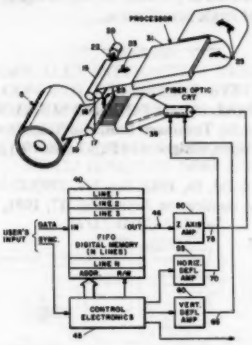
1. A method of recording a collection of data images in a given linear interval on a recording medium when said recording medium is transported to a fixed position before a display medium, said display medium to be synchronized with the transport of the recording medium to said fixed position, the method comprising the steps of:

a. transporting said recording medium a distance at least equal in length to said linear interval;

b. sequentially storing a plurality of lines of input data to be recorded on said recording medium in said linear interval;

c. retrieving the input data from storage, one line at a time; and

d. displaying said plurality of lines as retrieved, one line at a time, on said display medium by incrementing each line in



one direction on said display medium to permit the displaying of said plurality of lines over said linear interval.

4,560,990

RECORDING PAPER FEEDING APPARATUS

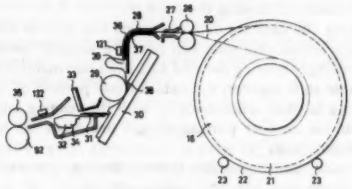
Takaji Sue, Atsugi, and Masatoshi Sugie, Zama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,800

Claims priority, application Japan, Aug. 31, 1982, 57-132527[U]; Aug. 31, 1982, 57-152028; Aug. 31, 1982, 57-152029; Nov. 16, 1982, 57-173750[U]

Int. Cl.⁴ G01D *15/28*

U.S. Cl. 346—17 **16 Claims**



1. Apparatus for indicating a loading condition of recording paper to be transported along a predetermined travelling path along which is disposed means for recording said recording paper and means for cutting said recording paper in the downstream of said means for recording with respect to the advancing direction of said recording paper along said path, said apparatus comprising:

first detecting means disposed at a first position in the upstream of said means for recording with respect to the advancing direction of said recording paper for detecting presence and absence of said recording paper at said first position;

second detecting means disposed at a second position in the downstream of said means for cutting with respect to the advancing direction of said recording paper for detecting presence and absence of said recording paper at said second position;

means for generating a first signal when both of said first and second detecting means have detected presence of said recording paper at said first and second positions, respectively; and

means for moving said recording paper along said travelling path.

4,560,991

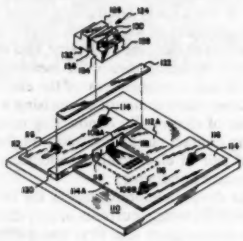
ELECTROFORMED CHARGE ELECTRODE STRUCTURE FOR INK JET PRINTERS

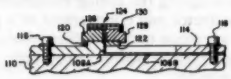
Walter L. Schutrum, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 517,608, Jul. 27, 1983, abandoned. This application Jan. 31, 1985, Ser. No. 696,682

Int. Cl.⁴ G01D *15/18*; H01S *4/00*

U.S. Cl. 346—75 **24 Claims**





1. A charge electrode structure for use in an ink jet printer comprising:

a dielectric substrate;

a plurality of spaced electrodes each having a length effective to charge ink droplets passing thereby, said electrodes being at least partially embedded in their depth dimension within said substrate and being at least partially exposed along their lengths at a first surface of said substrate; and

a plurality of electrically conducting circuit leads at least partially embedded in their depth dimension within said substrate and extending lengthwise along a second dimension of said substrate at an angle to said first surface, said circuit leads respectively being electrically connected to said electrodes,

said electrodes and said circuit leads having an embedded depth that exceeds the width of individual members of said electrodes and of said circuit leads, measured at said surface and said dimension.

4,560,992

IMAGE RECORDING ARRANGEMENT

Motohiko Hayashi, Ikoma; Toshiaki Karita, Sakurai; Matahira Kotani, Nara, and Hiromu Sasaki, Yamotokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 434,000, Oct. 13, 1982, Pat. No. 4,491,853. This application May 9, 1984, Ser. No. 608,404

Claims priority, application Japan, Oct. 19, 1981, 56-167602; Oct. 19, 1981, 56-167603; Oct. 19, 1981, 56-167604; Oct. 19, 1981, 56-167605

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—76 PH **5 Claims**

1. A thermal head recording system for recording information on a recording paper comprising:

recording head means having a plurality of thermal recording elements provided thereon for recording information on a recording head;

scan means for shifting said recording head means across said paper;

means for supplying information to be recorded by said recording head means as a plurality of information bits

corresponding to the number of thermal recording elements on said recording head means;

means, responsive to said means for supplying, for driving each said thermal recording element, said means for driving being timed with said scan means to facilitate the uniform printing of information on said paper, said means for driving including,

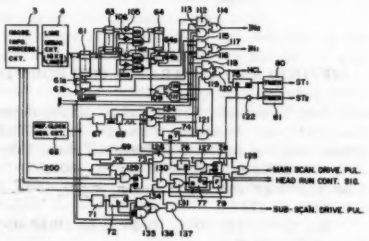
first memory means for storing said information bits received from said means from supplying to be presently recorded,

second memory means for storing the most recent previously received information bits recorded by said recording head means therein,

third memory means for storing compensation bit information therein, said compensation bit information having a numerical one to one correspondence with said information bits;

said first, second and third memory means having storage positions corresponding in number to the number of said plurality of thermal recording elements and being connected in a unique correspondence therewith,

means for developing said compensation bit information in response to the contents of said first and second memory registers, each bit of said compensation bit information being developed as a logical one when the corresponding information bit in said first register is a logical one and the corresponding information bit in said second register is a logical zero and being developed as a logical zero otherwise, said means for developing providing said compensation bit information to said third register means for storing therein;



fourth memory means for storing said information bits read from said first memory means;

fifth memory means for storing said compensation bit information read from said third memory means;

means for transferring said information bits from said first memory means to said fourth memory means and for transferring said compensation bit information from said third memory means to said fifth memory means,

first pulse producing means for developing pulses of a first duration;

second pulse producing means for developing pulses of a second duration greater than said first duration;

first enablement means, responsive to the contents of said fourth memory means and to said first pulse producing means, for driving said recording head means, each thermal recording element of said recording head means being driven when a corresponding bit position in said fourth memory means contains a logical one and said first pulse producing means develops a pulse of said first duration to thereby drive said thermal recording element for said first duration; and

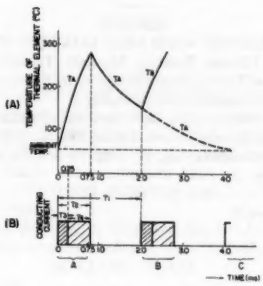
second enablement means, responsive to the contents of said fifth memory means and to said second pulse producing means, for driving said recording head means, each thermal recording element of said recording head means being driven when a corresponding bit position in said fifth memory means contains a logical one and said second pulse producing means develops a pulse of said second duration t_2 thereby drive said thermal recording element for said second duration.

4,560,993

THERMAL PRINTING METHOD AND THERMAL PRINTER

Akiyoshi Hakoyama, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1984, Ser. No. 586,805
Claims priority, application Japan, Mar. 7, 1983, 58-35914
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **5 Claims**



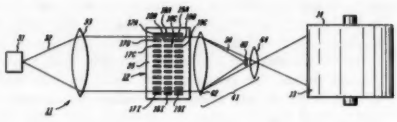
1. A thermal printing method, comprising the steps, for each of plural thermal elements disposed on a printing head, a step of inverting data printed in a preceding print cycle, a step of obtaining a logical product of the inverted data resulting from said inverting step and data to be printed in the instant print cycle, a step of pre-heating each of said thermal elements in dependence on said logical product, and a step of heating each of said thermal elements in dependence on the data to be printed in the instant print cycle for printing the data.

4,560,994

TWO DIMENSIONAL ELECTRO-OPTIC MODULATOR FOR PRINTING

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 309,650, Oct. 8, 1981, Pat. No. 4,480,899.
This application Aug. 17, 1984, Ser. No. 641,635
Int. Cl.[4] G01D *9/42;* **G02F** *1/01*
U.S. Cl. 346—108 **4 Claims**



1. An electro-optic line printer comprising

an electro-optic element;

means for applying a light beam to said electro-optic element, said light beam being collimated laterally of said electro-optic element;

a photosensitive recording medium;

means for advancing said recording medium at a predetermined rate in a cross line direction relative to said electro-optic element;

a rectilinear, two dimensional, planar array of electrodes intimately associated with said electro-optic element, said array including a plurality of separate rows and columns of electrodes, with the electrodes of each row being spaced apart laterally of said electro-optic element;

means for applying respective sets of data samples to the

electrodes of each of said rows, each of said data sample sets representing picture elements for a respective line of an image, whereby said electrodes couple electric fields into said electro-optic element to spatially modulate said light beam essentially simultaneously along a plurality of transverse axes in accordance with the picture elements for respective lines of said image; and

read out means optically aligned between said electro-optic element and said recording medium for imparting an intensity profile to said light beam corresponding to the spatial modulation thereof, whereby said recording medium is exposed in accordance with said picture elements for said lines of said image.

4,560,995
RECORDER WITH SELF LOADING FEED

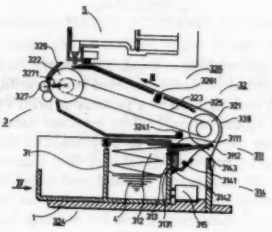
Tateo Suga; Hiroshi Tamura; Masaaki Taguchi, and Tokio Suzuki, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jul. 30, 1984, Ser. No. 635,652

Claims priority, application Japan, Sep. 1, 1983, 83-135566; Sep. 7, 1983, 83-138851; Sep. 12, 1983, 83-141270; Sep. 14, 1983, 83-141482; Sep. 20, 1983, 83-14504

Int. Cl.⁴ G01D *15/24*

U.S. Cl. 346—136 **8 Claims**



1. A recorder comprising, in combination,

a case;

a chart feed mechanism mounted in said case for feeding in incremental steps a chart having substantially equally spaced holes defined in at least one longitudinal edge thereof;

a recording head mounted in said case and movable in a direction substantially perpendicular to the direction of travel of said chart for recording data on said chart; wherein

said chart feed mechanism comprises a chart stock disposed in said case for storing said chart therein, said chart stock having a chart outlet; chart feed means having a discharge roller for discharging said chart from said chart stock, first presser means for pressing said chart against said discharge roller, a feed roller for feeding discharged chart, and second presser means for pressing said chart against said feed roller; a first sensor mechanism disposed in said case in confronting relation to said chart outlet for detecting whether said chart is present in said outlet and for applying a drive signal to said chart feed means when said chart is in said outlet; and a second sensor mechanism disposed in said case in confronting relation to said chart and positioned in a path of travel of said chart between said discharge roller and said feed roller, said second sensor mechanism being arranged to detect whether said chart is in said path a fixed period of time after said chart feed means has started being driven by said drive signal from said first sensor mechanism, to keep said chart feed means driven for a certain period of time when the chart is in the said path, and to apply a signal to inactivate said chart feed means when said chart is not present in said path.

4,560,996
PEN RECORDER

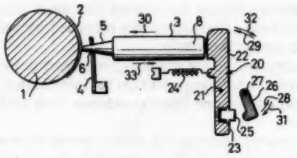
Shuichi Aratsu, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 24, 1984, Ser. No. 603,325

Claims priority, application Japan, Apr. 25, 1983, 58-71538

Int. Cl.⁴ G01D *15/16;* **B41J** *29/26*

U.S. Cl. 346—139 R **6 Claims**



1. A pen recorder comprising a pen adapted to be brought into contact with a recording paper, means including a return spring held to said pen for urging it in the direction away from said recording paper and a push-out means for pressing said pen into contact with the recording paper, and push-out means including control means coacting with a push-out spring for urging said pen into contact with the recording paper and having a force larger than that of said return spring.

4,560,997
METHOD AND APPARATUS FOR FORMING A PATTERN

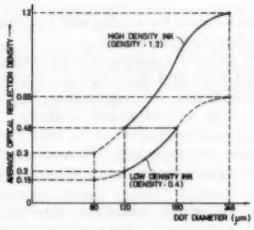
Yuichi Sato, Kawasaki; Nobuaki Sakurada, Yokohama; Hideaki Kawamura, and Yoshitaka Watanabe, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,059

Claims priority, application Japan, Jul. 7, 1982, 57-119068; Jul. 8, 1982, 57-119495

Int. Cl.⁴ G01D *15/18;* **H04N** *1/22;* **H01J** *40/14*

U.S. Cl. 346—140 R **17 Claims**



1. A half tone image forming method for forming a half tone image by arranging elementary pattern marks in response to a signal representing the optical density of the image, the method comprising the steps of:

providing a plurality of types of elementary pattern marks with different inherent densities;

arranging the elementary pattern marks on a recording medium at equal distances;

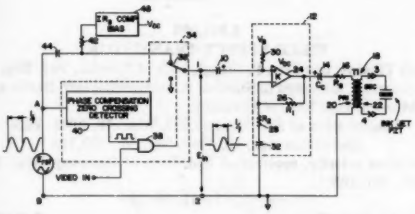
selecting one of the types of elementary pattern marks in response to the signal; and

varying the size of the elementary pattern marks in response to the signal such that the ratio of the dimension across elementary pattern marks of the highest inherent density to the distance therebetween is at least about 0.5.

4,560,998
LOW VOLTAGE TRANSFORMER COUPLED INK JET DRIVER

Guenther W. Wimmer, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 18, 1984, Ser. No. 631,969
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 5 Claims



1. A low voltage PZT ink jet driver circuit, wherein the PZT ink jet is capacitive, for developing, in response to a low voltage video signal, a high voltage PZT excitation signal to be applied to a PZT ink jet to excite said ink jet to print at a selected droplet frequency, said circuit comprising:

input terminal means for receiving the low voltage video signal;

power gain means coupled to the input terminal means for amplifying the low voltage video signal to produce a signal having an intermediate voltage level;

a serially connected capacitor-resistor network having one end coupled to the output terminal of the power gain means;

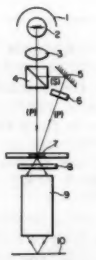
step-up transformer means, having a primary winding and a secondary winding, for stepping-up the video signal from the intermediate voltage level across the primary winding to the selected PZT excitation voltage level across the secondary winding, said primary winding being coupled between the other end of the capacitor-resistor network and the input terminal means; and

output terminal means, coupled to the two ends of the secondary winding of the transformer means and disposed to have coupled thereto said PZT ink jet for applying said high voltage excitation signal to the PZT ink jet.

4,560,999
PRINTER HEAD AND ELECTROPHOTOGRAPHIC PRINTER UTILIZING THE SAME

Mitsuhiro Tokuhara, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,165
Claims priority, application Japan, Jan. 11, 1983, 58-2637
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 20 Claims



10. An electrophotographic printer having a printer head and a photosensitive member, the printer head comprising a light source device, an optical modulator element for switching the light projected from the light source device, a means of splitting the light projected from the light source device into two polarized light components which components propagate respectively along a first light path and a second light path, a means of converting the polarized light of the second light path into light having the same polarization as the light component of the first light path, and a means of directing light of at least one of the first and second light paths to the optical modulator element.

4,561,000
HEAT-SENSITIVE RECORDING UNIT

Michihiro Tsujimoto, Tachikawa; Makoto Asano, Yokohama; Kiyoharu Hasegawa, Kamakura, and Hiroyuki Akahori, Yokosuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP83/00250, § 371 Date Dec. 1, 1983, § 102(e) Date Dec. 1, 1983
PCT Filed Aug. 2, 1983, Ser. No. 557,181
Claims priority, application Japan, Jul. 27, 1983, 58-135695
Int. Cl.[4] B41N[1] *5/18*
U.S. Cl. 346—208 10 Claims

1. A heat-sensitive recording unit comprising

(a) a methine-type chromogenic reactant represented by the formula

wherein X, Y and Z are the same or different and individually are a substituted or unsubstituted phenyl, naphthyl, β-styryl or aromatic heterocyclic residual group, two of X, Y and Z may be coupled together to form a ring, and the substituted or unsubstituted phenyl, naphtyl or β-styryl group has at least one amino, substituted amino or lower alkoxyl group at the para-position relative to the central methine group of the molecule when one or none of X, Y and Z is the aromatic heterocyclic residual group,

(b) an oxidizing organic compound selected from unsublimable and water-insoluble benzoquinone derivatives substituted with an electron-attractive group, and

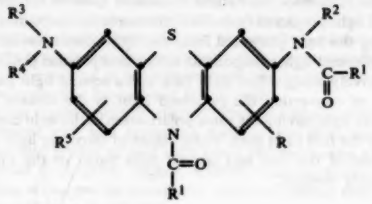
(c) a color production sensitivity regulator which has a melting point of from 70° C. to 150° C. and, when molten, dissolves the chromogenic reactant and/or the oxidizing organic compound, the components (a), (b) and (c) being supported on a substrate.

4,561,001
ELECTROCHROMIC MARKING SYSTEMS

Michael B. Gunn, and William M. Hung, both of Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Jul. 31, 1984, Ser. No. 636,460
Int. Cl.[4] B41M *5/20*
U.S. Cl. 346—218 8 Claims

1. A substrate for use in electrochromic recording comprising a support sheet containing as a color-forming substance a 1/2-R-3-[N(R^1-CO)-N-R^2-amino]-7-[N-(R^3)(R^4)-amino]-8/9-R^5-10-(R^1-CO)-phenothiazine having the formula



wherein:

R and R^5 independently represent hydrogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halogen or nitro;

R^1 represents hydrogen, non-tertiary C_1 to C_{12} alkyl, C_4 to C_8 cycloalkyl, non-tertiary C_1 to C_4 alkoxy or non-tertiary C_1 to C_4 alkoxycarbonyl, phenyl, phenyl substituted by one to three of non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, nitro, halo, phenyl, cyano, or trihalomethyl;

R^2 represents C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy; and

R^3 and R^4 independently represent C_1 to C_4 alkyl, phenyl, phenyl substituted by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, benzyl or benzyl substituted in the benzene ring by one or two of halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy.

4,561,002

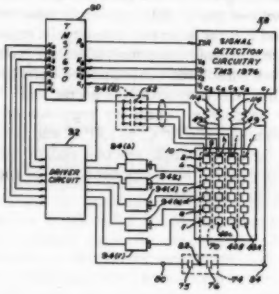
CAPACITIVE TOUCH SWITCH ARRANGEMENT

Norman H. Chiu, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 30, 1982, Ser. No. 412,737

Int. Cl.⁴ G08C *9/00*

U.S. Cl. 340—365 C **10 Claims**



2. A capacitive touch switch arrangement comprising:

a scan signal generating means;

a substrate of dielectric material having first and second opposed surfaces;

a first electrode formed on said first surface responsive to human touching proximate thereto;

a second electrode formed on said second surface to enable the capacitive coupling of the signal from said first electrode to said second electrode, said capacitive coupling being altered by human touching proximate said touch electrode;

a capacitive element separate from said first and second electrode for coupling the scan signal from said signal generating means to said first electrode;

a conductive path formed on said first surface for electrically connecting said capacitive element to said first electrode;

input signal detection means coupled to said second electrode and operative to detect the alteration of said capacitive coupling resulting from said proximate human touching.

4,561,003

FIELD EFFECT TRANSISTOR

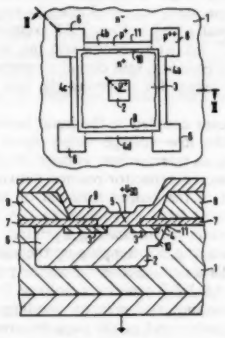
Jenö Tihanyi, and Jens P. Stengl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 245,033, Mar. 18, 1981. This application Apr. 13, 1984, Ser. No. 600,192

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012185

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **7 Claims**



1. Field effect transistor, comprising a substrate of a given first conductivity type having a surface, a first zone of a second conductivity type embedded planar in said substrate, a second zone of said first conductivity type being embedded planar in said first zone, a first p-n junction mutually bordering said first and second zones, a second p-n junction mutually bordering said first zone and said substrate, both of said p-n junctions emerging to said surface of said substrate, at least one channel zone disposed between said p-n junctions, and a gate electrode at least covering said channel zone and being insulated from said surface of said substrate, wherein said channel zone is subdivided into straight sections, and said first zone includes regions of said second conductivity type being part of said first zone, said regions being more highly doped than said sections of said channel zone and being disposed between said sections of said channel zone forming a contiguous structure with said sections.

4,561,004

HIGH DE' SITY, ELECTRICALLY ERASABLE, FLO. .TING GATE MEMORY CELL

Chang-Kiang Kuo, Houston, and Shyh-Chang Tsaur, Stafford, both of Tex., assignors to Texas Instruments, Dallas, Tex.

Division of Ser. No. 88,708, Oct. 26, 1979, Pat. No. 4,317,272. This application Mar. 1, 1982, Ser. No. 353,304

Int. Cl.⁴ H01L *29/78, 27/02, 29/04;* G11C *11/40*

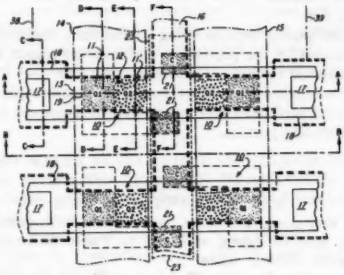
U.S. Cl. 357—23.5 **6 Claims**

1. A semiconductor device comprising:

a region in a face of a body of semiconductor material, said region being of opposite type from and doped more heavily than the semiconductor material below the region in

the body, said region covered by field insulator at said face,

a first conductive layer overlying said face and separated from said semiconductor material by an insulator much thinner than said field insulator, said first conductive layer forming a first electrode located adjacent but spaced from said region, the first conductive layer including a first part overlying said region by a significant amount,



a second conductive layer on said face overlying the first conductive layer except for said part and defining a second electrode which is substantially not overlapping said region and,

a third conductive layer overlapping said region and said first part, said third conductive layer generally not overlapping the second conductive layer, nor overlapping the first conductive layer except for said first part.

4,561,005

SOLID-STATE INFRARED RADIATION IMAGING DEVICES HAVING A RADIATION-SENSITIVE PORTION WITH A SUPERLATTICE STRUCTURE

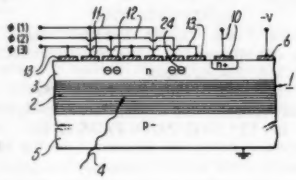
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 411,730, Aug. 28, 1982, abandoned. This application Jun. 28, 1984, Ser. No. 625,413

Claims priority, application United Kingdom, Sep. 18, 1981, 8128310

Int. Cl.⁴ H01L *29/78, 27/14, 31/00*

U.S. Cl. 357—24 **20 Claims**



1. An infrared radiation imaging device comprising a semiconductor body made of a semiconductive material having an energy band gap which is greater than the quantum energy of the infrared radiation forming the infrared image, said semiconductor body comprising:

a radiation-sensitive portion comprising a plurality of alternating n-type and p-type layers which form an energy-band-bending superlattice structure in the body at the location of the alternating layers, said energy-band-bending superlattice structure having a reduced effective band gap, the alternating n-type and p-type layers having doping concentrations and thicknesses such that they can be depleted throughout their thicknesses without causing breakdown to occur, wherein free charge carriers are generated in the superlattice structure by excitation across the effective band gap on absorption of infrared radiation therein; and

a signal processing portion having a charge transfer shift register in which the radiation-generated charge carriers are collected and transported to an output, said radiation-generated charge carriers producing an electrical signal representative of the detected radiation at the output.

4,561,006

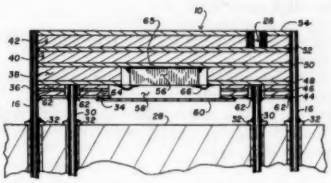
INTEGRATED CIRCUIT PACKAGE WITH INTEGRAL HEATING CIRCUIT

Thomas P. Currie, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,551

Int. Cl.⁴ H01L *21/48, 23/14, 23/18, 23/34*

U.S. Cl. 357—28 **14 Claims**



1. An improved integrated circuit package having improved capability for installation and removal comprising:

a plurality of electrically insulating support members, each having predetermined patterns of electrically conductive materials deposited on at least portions thereof, predetermined ones of said electrically insulating support members having first access apertures, and other predetermined ones of said electrically insulating support members having pin receiving apertures;

a further electrically insulating support member positioned between said predetermined ones and said other predetermined ones of said electrically insulating support members;

an auxiliary heat generating element deposited in a predetermined pattern on said further electrically insulating support member and having receiving means associated therewith and in cooperative relation to said first access apertures, said auxiliary heat generating element arranged for providing heat at a predetermined level in response to external electrical power applied to said receiving means;

said pluarlity of electrically insulating support members and said further electrically insulated support member arranged in juxtaposition such that all of said electrically conductive materials are electrically insulated from said auxiliary heat generating element, and are formed in a unitary body; and

interconnection means, including solder connections, for making electrical and physical interconnection between portions of said electrically conductive materials and associated interconnection pins in said pin receiving apertures when said solder is caused to flow in response to said heat at a predetermined level in response to application of said external electrical power.

4,561,007

DOUBLE MESA AVALANCHE PHOTODETECTOR

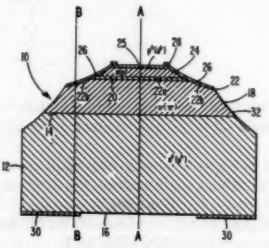
Paul P. Webb, Beaconsfield, Canada, assignor to RCA Inc., Toronto, Canada

Filed Sep. 14, 1984, Ser. No. 650,636

Claims priority, application Canada, Apr. 10, 1984, 451638

Int. Cl.[4] H01L *27/14*

U.S. Cl. 357—30 **7 Claims**



1. An avalanche photodetector comprising

a semiconductor substrate having first and second major surfaces;

an absorptive region overlying the first major surface and having a region surface comprising a planar area and a surrounding non-planar area;

a first region overlying said planar area;

a second region overlying the first region and said non-planar area;

a first electrical contact overlying said second region; and

a second electrical contact to the substrate;

the substrate, the absorptive region and the first region have one conductivity type and the second region has the opposite conductivity type.

4,561,008

BALLASTED, GATE CONTROLLED SEMICONDUCTOR DEVICE

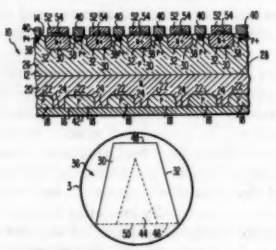
Hans W. Becke, Morristown, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 18, 1978, Ser. No. 870,484

Claims priority, application United Kingdom, Feb. 7, 1977, 04943/77

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 **8 Claims**



1. A gate controlled semiconductor device comprising:

a body of semiconductor material having first and second major opposing surfaces;

an anode region having one type conductivity adjacent said second surface;

a base region having a second type conductivity adjacent said anode region and forming a first PN junction at the interface therewith;

a gate region having said one type conductivity adjacent said base region and forming a second PN junction at the interface therewith, said gate region extending to said first surface;

a cathode region having said second type conductivity adjacent said first surface and extending into said gate region and forming a third PN junction at the interface therewith, said third PN junction terminating at said first surface;

said cathode region including an integral defocusing portion,

a cathode electrode overlying and electrically contacting said cathode region without contacting said defocusing portion;

said defocusing portion being substantially completely surrounded by the portion of said cathode region which is contacted by said cathode electrode; and

said base region extending through said anode region to said second surface in substantial vertical alignment with said defocusing portion.

4,561,009

SEMICONDUCTOR DEVICE

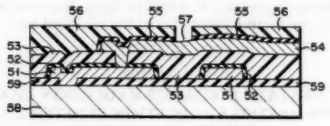
Toshio Yonezawa, Yokosuka, and Masaharu Aoyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 166,182, Jul. 7, 1980, Pat. No. 4,433,004. This application Nov. 22, 1983, Ser. No. 554,336

Claims priority, application Japan, Jul. 11, 1979, 54-87717; Jul. 11, 1979, 54-87718

Int. Cl.[4] H01L *21/283, 23/54, 23/08*

U.S. Cl. 357—67 **9 Claims**



1. A semiconductor device comprising a semiconductor substrate; a metal wiring layer comprising an Al alloy formed on the surface of said substrate; and means for blocking water and Na, said means comprising an alumina layer covering said metal layer and containing at least one metal selected from the group consisting of Cu, Mg, Ni, Cr, Mn, Ti and Y.

4,561,010

ELECTRICALLY INSULATING SILICON CARBIDE SINTERED BODY

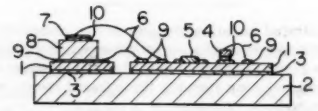
Satoru Ogihara; Yukio Takeda; Kunihiro Maeda; Kousuke Nakamura, and Mitsuru Ura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,514

Claims priority, application Japan, Dec. 7, 1981, 56-197133

Int. Cl.[4] H01L *23/14, 23/34, 23/08*

U.S. Cl. 357—74 **14 Claims**



1. An electrically insulating silicon carbide sintered body having an electrical resistivity of 10^7 Ω.cm or above at room temperature, comprising silicon carbide as a principal component, a first component for providing an electrical insulating quality to said silicon carbide, and first component consisting essentially of at least one of metallic beryllium, beryllium compounds, boron and a boron compounds and being con-

tained in said body in a total amount of 0.01 to 3.5% by weight calculated, respectively, as beryllium or boron and a second component which can further promote the sinterability provided to said silicon carbide by said first component and which does not diffuse easily into particles of said silicon carbide, the second component consisting essentially of at least one member selected from the group consisting of the elements in Groups I, II, III, IV, V, VIa, VIIa or VIII of the Periodic Table, other than hydrogen, francium, beryllium, radium, mercury, boron, aluminum, carbon, and iron, and compounds of said elements, said second component being contained in said body in a total amount of 0.01 to 10% by weight with the balance of said body consisting essentially of said silicon carbide.

4,561,011

DIMENSIONALLY STABLE SEMICONDUCTOR DEVICE

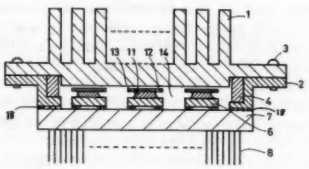
Masanobu Kohara; Shin Nakao, and Hiroshi Shibata, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,840

Claims priority, application Japan, Oct. 5, 1982, 57-176524; Oct. 5, 1982, 57-176525

Int. Cl.⁴ H01L *27/10, 23/10*

U.S. Cl. 356—81 **5 Claims**



1. A semiconductor device, comprising:

a base board,

a semiconductor chip having two main faces and mounted onto said base board at one of said two main faces,

a metallic plate of good thermal conductivity mounted onto said semiconductor chip at the other of said two main faces,

a heat dissipating and enclosing member mounted onto said base board for hermetically enclosing said semiconductor chip and having a portion facing said metallic plate mounted onto said other main face of said semiconductor chip with a gap therebetween for dissipating heat of said semiconductor chip,

a first adhesive material interposed between said metallic plate and said other main face of said semiconductor chip for mounting said metallic plate onto said other main face of said semiconductor chip, and

a second adhesive material interposed between said heat dissipating and enclosing member and said base board for hermetically mounting said heat dissipating and enclosing member onto said base board,

said first adhesive material being selected to have a melting point lower than that of said second adhesive material, mounting of said metallic plate onto said other main face of said semiconductor chip with said first adhesive material and mounting of said heat dissipating and mounting member onto said base board with said second adhesive material being carried out by simultaneous heating of said first and second adhesive materials to said melting points thereof, said gap between said metallic plate and said portion of said heat dissipating and enclosing member facing said metallic plate being formed and dimensionally controlled as a result of earlier soldification of said second adhesive material in relation to said first adhesive material.

4,561,012

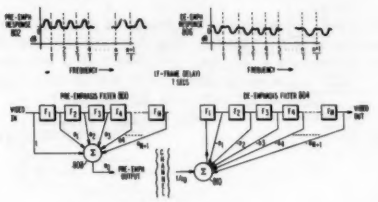
PRE-EMPHASIS AND DE-EMPHASIS FILTERS FOR A COMPOSITE NTSC FORMAT VIDEO SIGNAL

Alfonse Acampora, Staten Island, N.Y., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 27, 1983, Ser. No. 565,285

Int. Cl.⁴ H04N *9/42, 9/32, 9/535, 5/21*

U.S. Cl. 358—11 **7 Claims**



1. A transmitter for use in a television signal communication system comprising said transmitter and a receiver; wherein said transmitter includes translation means for deriving a communication signal communicated to said receiver in response to the application thereto of a composite NTSC format video signal of a two-dimensional image of picture elements (pixels) that are repetitively scanned at the NTSC predetermined frame rate, whereby stationary portions of said image result in a video signal luminance component that recurs at said predetermined frame rate and a video signal chrominance component that recurs only at one-half said predetermined frame rate; said transmitter translation means comprising:

first means for modifying said video signal by phase inverting solely the NTSC color carrier and phase-modulated chrominance component of each of alternate frames of said video signal, thereby providing substantially the same phase for the chrominance component of each of said alternate frames as for the chrominance component of each of the remaining frames of said video signal; and

second means including a pre-emphasis comb filter coupled to said first means and responsive to said modified video signal for deriving an output in which those frequency components of said modified video signal which are equal to odd integral multiples of half said predetermined frame rate are pre-emphasized with respect to those frequency components of said modified video signal which are equal to even integral multiples of half said predetermined frame rate.

4,561,013

COLOR SIGN INSERTING CIRCUIT FOR VIDEO SIGNAL REPRODUCING SYSTEM

Tsutomu Fukui, and Tomoyuki Shirai, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 460,079

Claims priority, application Japan, Mar. 1, 1982, 57-30649

Int. Cl.⁴ H04N *9/535*

U.S. Cl. 358—22 **1 Claim**

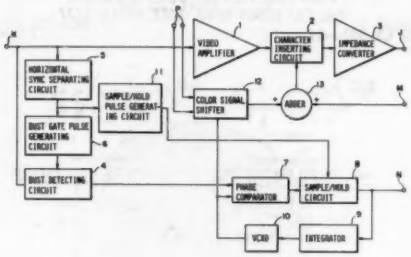
1. A color sign inserting circuit for video reproducing system comprising:

a reproducing system for a reproduced video signal which is read from a recording medium and is reproduced through a video signal demodulating circuit;

a color burst signal detecting circuit for extracting color burst signals from said reproduced video signal;

a flywheel oscillator whose oscillating output has a frequency and phase locked to the average frequency and phase of the color burst signals extracted by said color burst signal detecting circuit and which detects time axis variation components and produces a color burst phase error signal;

a color signal phase shifting circuit receiving said oscillating output of said flywheel oscillator as a chrominance subcarrier and further receiving a chrominance control signal to determine the color of the sign;



an adder producing a color sign signal by adding the output of said phase shifting circuit to a sign signal which has luminance data ;and

a sign inserting circuit provided in said reproducing system for superimposing upon said reproduced video signal said color sign signal.

4,561,014

METHOD AND CIRCUIT FOR FREQUENCY AND PHASE LOCKING A LOCAL OSCILLATOR FOR TELEVISION

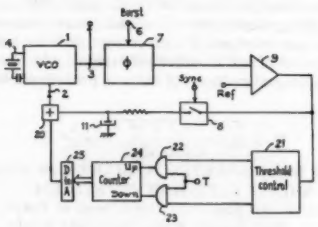
Patrick Douziech, Rives Sur Fures, and Michel Imbert, Seyssin, both of France, assignors to Thomson CSF, Paris, France

Filed Dec. 21, 1983, Ser. No. 563,866

Claims priority, application France, Dec. 23, 1982, 82 21624

Int. Cl.⁴ H04N *9/50, 9/46*

U.S. Cl. 358—25 **3 Claims**



1. A method of frequency and phase locking an oscillator on a color burst signal in a television system, the oscillator including a frequency and phase controlling input, and the method consisting in:

comparing the phase of an output signal from the oscillator with the phase of the color burst signal while said color burst signal is present;

producing an error signal which is applied to said control input;

checking whether the error signal lies inside or outside a predetermined range (V1-V2); and

when the error signal lies outside said predetermined range, acting on an up/down counter having a count output which is converted to analog form and which is also applied to said control input in such a manner as to tend to bring said error signal into said predetermined range.

4,561,015

ALL-SOLID-STATE TELEVISION CAMERA

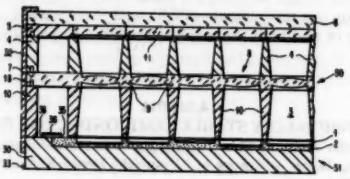
Hans-Erdmann Korch, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1983, Ser. No. 476,291

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 82102718[U]

Int. Cl.⁴ H04N *3/14, 9/07*

U.S. Cl. 358—44 **18 Claims**



1. A solid-state television camera with semiconductor image sensors

which are to be exposed via imaging optics, and which consists of a monolithically integrated microcircuit comprising horizontal and vertical scanners as well as output amplifiers and which is substrate-tied and connected via contact pads of said microcircuit to substrate contact parts, clock pulses being applicable to said sensors for horizontal as well as vertical scanning via further contact pads connected to corresponding ones of said substrate contact parts

characterized in that at least one linear array of said semiconductor image sensors is provided in a single semiconductor wafer to form an electronic unit,

wherein the control inputs of the output amplifiers are selectively addressable via output control lines connected to respective ones of said substrate contact parts and that said horizontal and vertical scanners are selectively addressable via clock pulse control lines connected to respective ones of said substrate contact parts;

an optical unit for the purpose of mutual light shading of adjacent beam paths and including all imaging optics, each imaging optics having an associated light funnel extending at least between said optics and an associated semiconductor image sensor wherein said optical unit and said electronic unit are mounted in a housing,

characterized in that at least one lens array is provided which carries as a fixed focus raster optics said imaging optics with an image distance that is negligible compared with the object distance, the lenses of said array being separated from each other by frame walls and being also supported thereby, and wherein said array is mounted by means of a light funnel array placed against the frame walls and at least partly forming said light funnels at a distance from said semiconductor wafer that is predetermined by the image spacing.

4,561,016

METHOD AND APPARATUS FOR RECORDING COLOR PICTURES FOR MULTICOLOR PRINTING

Eggert Jung, Schönberg; Christian Roes, Kiel; Andreas Wigger, Kiel, and Ernst-August Ziemen, Kiel, all of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,581

Claims priority, application European Pat. Off., Jun. 4, 1982, 82104918.6

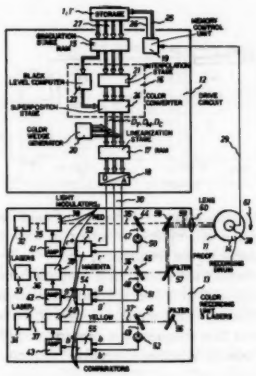
Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—76 **23 Claims**

1. A method for producing color pictures which are used for quality control in multicolor printing by means of exposing

chromatic photographic material such as paper or film with chromatic light, whereby the colors produced on the chromatic photographic material by exposure coincide with the colors to be printed on a print medium, characterized in that, the following steps are accomplished:

(a) before recording the color picture identifying the color density values for the photographic chromatic material



required for a color-equivalent recording by mensurational or visual comparison of printed and exposed colors;

(b) using the color separation values of the color which are to be printed and the corresponding color density values during the recording of the color picture;

(c) determining the allocated color density values instead of the color separation values and converting the color density values into drive values for a color exposure unit.

4,561,017

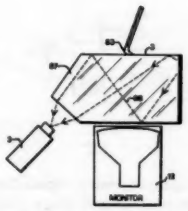
GRAPHIC INPUT APPARATUS

Richard Greene, 700 31st Ave. #2, San Francisco, Calif. 94123

Filed Aug. 19, 1983, Ser. No. 524,534

Int. Cl.⁴ H06N 7/18

U.S. Cl. 358—93 **12 Claims**



1. A graphical input device comprising:

a transparent material with one surface thereof defining a drawing surface, with the index of refraction of the material being greater than the index of refraction of the medium on one side of the drawing surface;

light absorbing means located on the other side of said drawing surface;

camera means located on said other side of said drawing surface and in a manner to only capture light rays which originate from said light absorbing means and which have been totally internally reflected from said drawing surface whereby lighted objects placed on said drawing surface will be imaged by said cameral means only when said objects are in direct contact with said one side of said drawing surface, with the remaining field being dark due to said light absorbing means.

4,561,018

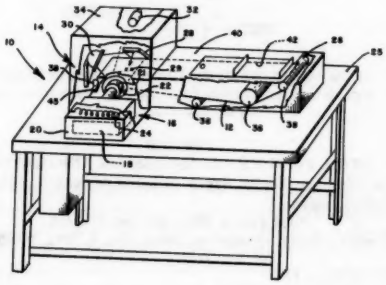
APPARATUS FOR CONTINUOUSLY INSPECTING THE PHYSICAL CHARACTERISTICS OF PARTICULATE MATTER

Robert O. Berthel, Windham, N.H.; Vernon G. Plank, Mansfield, and Dennis L. LaGross, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1982, Ser. No. 442,493

Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—107 **16 Claims**



1. An inspection apparatus for continuously viewing the physical characteristics of particulate matter, comprising:

means for collecting said particulate matter and conveying said particulate matter to a preselected area, with said particulate matter remaining on said collecting and conveying means at said preselected area;

means situated adjacent said preselected area for providing sufficient illumination of said particulate matter at said preselected area and for providing an image of said particulate matter from above;

means optically aligned with said image of said particulate matter for monitoring said particulate matter and providing signals representative thereof; and

means operably connected to said monitoring means for receiving said signals and providing a display of said particulate matter at a preselected magnification.

4,561,019

FREQUENCY DIVERSITY FOR IMAGE ENHANCEMENT

Frederic L. Lizzi, Tenafly, N.J.; Marek Elbaum, Dobbs Ferry, and Ernest J. Feleppa, Rye, both of N.Y., assignors to Riverside Research Institute, New York, N.Y.

Filed May 16, 1983, Ser. No. 494,633

Int. Cl.⁴ H04N 7/18

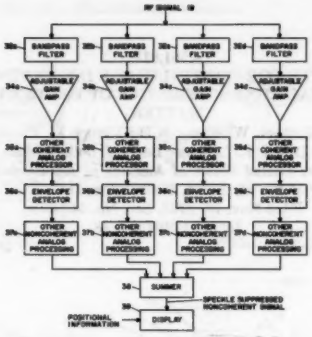
U.S. Cl. 358—112 **36 Claims**

1. A method of reducing speckle in signals received from an object irradiated with finite-bandwidth, coherent pulses of any form of radiation that exhibits a wave nature, comprising:

generating finite-bandwidth, coherent pulses and transmitting said pulses toward an object;

receiving the signals scattered by said object to derive therefrom separate, component, noncoherent signals, each representative of the components of said scattered signals in component frequency bands within said finite bandwidth; and

combining the component, noncoherent signals to obtain composite noncoherent signals, wherein the degradation



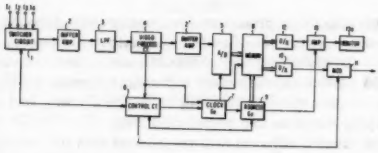
of the signals due to speckle is less than in noncoherent signals derived directly from the original received signals.

4,561,020

STILL PICTURE TRANSMISSION APPARATUS

Akio Matsuda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,355
Claims priority, application Japan, Jun. 4, 1982, 57-95930
Int. Cl.⁴ H04N *7/18, 7/12*
U.S. Cl. 358—134 **9 Claims**



1. A still picture transmission apparatus for transmitting still pictures over a transmission line comprising:

means responsive to a plurality of video signals for sequentially selecting one of them;

memory means for compressing the video signals delivered from said selecting means and for storing the compressed video signals at predetermined areas, each of said areas corresponding to one of said plurality of video signals;

means for reading the compressed video signals from said memory means at a speed corresponding to the frequency bandwidth of the transmission line;

means for transmitting the compressed video signals read by said reading means to said transmission line; and

means for advancing the selection operation of said selecting means when a selected video signal delivered from said selecting means does not contain video information.

4,561,021

FREQUENCY DETERMINING APPARATUS

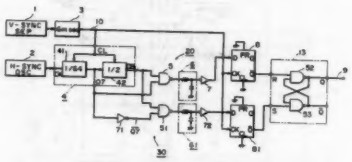
Norio Abe, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1983, Ser. No. 478,520
Claims priority, application Japan, Apr. 5, 1982, 57-57681
Int. Cl.⁴ H04N *5/05*
U.S. Cl. 358—158 **3 Claims**

1. Apparatus for discriminating between two frame frequencies in television signals including:

means for detecing a first frame frequency and providing a signal indicative of presence or absence of said first frame frequency, said means for detecting said first frame frequency further including means providing an accurate indication of presence of said first frame frequency and susceptible to error in indicating absence of said first frame frequency,

means for detecting a second frame frequency and providing a signal indicative of presence or absence of said second frame frequcney, said means for detecting said second frame frequency further including means providing an



accurate indication of presence of said second frame frequency and susceptible to error in indicating absence of said second frame frequency, and

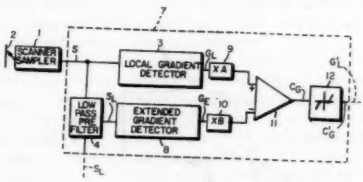
two-state means for combining outputs from said means for detecting said first and second frequencies and operable for providing an output responsive to said first means when said first frequency is present and responsive to said second means when said second frequency is present.

4,561,022

IMAGE PROCESSING METHOD BASED ON PROCESSING OF INTERRELATED IMAGE GRADIENTS

Bryce E. Bayer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1983, Ser. No. 522,286
Int. Cl.⁴ H04N *5/213, 5/14, 5/208*
U.S. Cl. 358—167 **14 Claims**



1. A method of image processing especially arranged to stress the interrelationship of various image gradients existing in an image, said method comprising the steps of:

generating image signals representative of the light value of elements of the image;

generating a first gradient signal in response to a combination of image signals representative of an image gradient over a first portion of the image;

generating a second gradient signal in response to a combination of image signals representative of an image gradient over a second image portion that is greater than said first image portion;

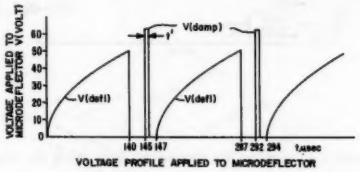
generating a composite signal from the combination of said first and second gradient signals; and

modifying said image signals according to a noise-sensitive function that operates upon a characteristic of said composite signal.

4,561,023
DAMPENING SYSTEM FOR MICRO-DEFLECTOR SCANNING BEAM MODULATOR

Kwok-leung Yip, Webster, and Martin E. Banton, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 16, 1983, Ser. No. 523,983
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—208 9 Claims



VOLTAGE PROFILE APPLIED TO MICRODEFLECTOR

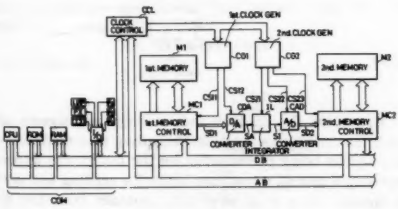
1. In a micro-deflector having at least one flexible finger with a mirror-like surface for reflecting a beam impinged thereagainst, and a support permitting the finger to deflect in response to the application of a first predetermined electrical potential thereto and reflect said beam in another direction, the improvement comprising:

control means to impose a second predetermined electrical potential on said finger following removal of said first potential whereby to dampen oscillations of said finger and speed up return of said finger to an undeflected position.

4,561,024
IMAGE PROCESSING METHOD AND APPARATUS

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,316
Claims priority, application Japan, Oct. 23, 1980, 55-147580
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—287 19 Claims



1. An image processing method comprising:

a first step of serially producing an analog image data signal in accordance with a first clock signal;

a second step of converting said analog image data signal into a digital signal;

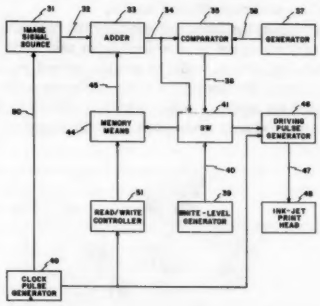
a third step of transmitting said digital signal to storage means, in accordance with a second clock signal different from said first clock signal, the frequency of said second clock signal being set in a predetermined proportional relation to the frequency of said first clock signal in accordance with a magnification factor; and

a fourth step of storing said digital signal in said storage means.

4,561,025
INK-JET RECORDING SYSTEM CAPABLE OF RECORDING A HALF-TONE

Mitsuo Tsuzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,903
Claims priority, application Japan, Aug. 31, 1983, 58-159822
Int. Cl.[4] H04N *1/22;* G01D *15/18*
U.S. Cl. 358—298 11 Claims



1. An ink-jet recording system for recording points in an image as dots on a recording medium, said system comprising:

means including an ink-jet print head responsive to driving pulses for ejecting ink droplets to record said dots on said recording medium, the volume of said ejected ink droplets corresponding to the energy content of said driving pulses;

means for generating said driving pulses and for suppling said driving pulses to said ink-jet print head;

memory means having an output signal corresponding to information stored therein;

means for adding an image signal indicative of the points of said image being recorded to said output of said memory means;

means for comparing an output of said adding means with a signal having a predetermined value, means responsive to said comparing means for storing said output of said adding means in said memory means only when the level of said output of said adding means is less than the level of said signal having said predetermined value; and

means for supplying said output of said adding means to said driving pulse generating means, said energy content of said driving pulse being varied in response to said output of said adding means.

4,561,026
REPRODUCING APPARATUS FOR REPRODUCING RECORDED SIGNALS FROM A ROTARY RECORDING MEDIUM

Ryozo Abè, and Masaki Sakurai, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 10, 1984, Ser. No. 569,585
Claims priority, application Japan, Jan. 14, 1983, 58-3601[U]
Int. Cl.[4] H04N *5/76;* G11B *21/10*
U.S. Cl. 358—336 4 Claims

1. A reproducing apparatus for reproducing recorded signals from tracks on a rotary recording medium, said rotary recording medium being repeatedly recorded with a video signal of the same unit for a duration which amounts to a plurality of fields in each track turn, and with a track shift address signal in at least one location in each track turn, said track shift address signal being recorded with a predetermined period and instructing the existence of a forced track shift of a pickup reproducing element and instructing the position and

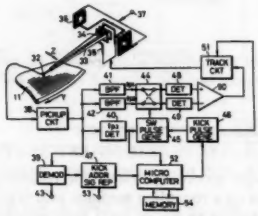
the direction of the track shift, said pickup reproducing element reproducing the recorded signals from said rotary recording medium by moving along a scanning locus which is based on the instructions contained in said track shift address signal, said reproducing apparatus comprising:

reproducing means including said pickup reproducing element, for reproducing the recorded signals from said rotary recording medium;

an address signal reproducing circuit for reproducing said track shift address signal from the signals which are reproduced by said reproducing means;

detecting means for detecting whether the reproduced track shift address signal is produced from said address signal reproducing circuit with the predetermined period;

memory means for storing the value of the reproduced track shift address signal or a flag which is related to the value of the reproduced track shift address signal, when said



detecting means detects that said track shift address signal is reproduced with the predetermined period; and

control signal generating means for generating a control signal which causes said pickup reproducing element to undergo a forced track shift at predetermined positions on the tracks so that said pickup reproducing element scans along a scanning locus which has the same periodicity as the scanning locus along which said pickup reproducing element had been scanning up to that point, said control signal being generated based on the value of the reproduced track shift address signal when said detecting means detects that said track shift address signal is reproduced with the predetermined period, and based on one or a plurality of values which are pre-stored in said memory means when said detecting means detects that said track shift address signal is not reproduced with the predetermined period.

4,561,027

ROTATING D.C. COUPLED RECORD AMPLIFIER FOR DIGITAL MAGNETIC RECORDING

Richard K. Sita, Erial; John R. Orr, Pennsauken, and John L. Waring, Mt. Laurel, all of N.J., assignors to RCA Corporation, Princeton, N.J.

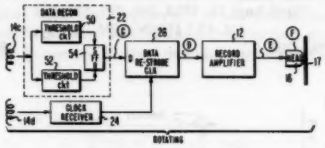
Filed Mar. 21, 1983, Ser. No. 477,389

Claims priority, application United Kingdom, Nov. 29, 1982, 8233925

Int. Cl.[4] G11B *5/02, 5/09*

U.S. Cl. 360—39 **19 Claims**

1. Apparatus for A.C. transmitting data comprising means for extracting data edge information from said data to produce a data edge signal having an average value that does not vary substantially with the DC content of said data, transformer means having a primary side responsive to said data edge signal for A.C. transmitting said data edge information to the secondary side of said transformer means, means coupled to said transformer means for transmitting data clock information, recovering means coupled to said secondary side for recovering said data from the transmitted edge information, and retim-



ing means for retiming the recovered data using the transmitted clock information.

4,561,028

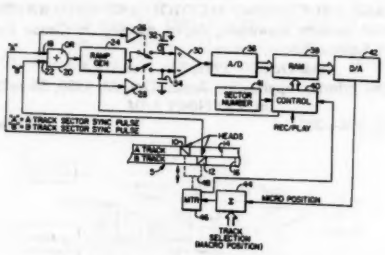
APPARATUS AND METHOD FOR READING AND WRITING DATA ON A MAGNETIC DISC

Barrett E. Guisinger, Saratoga, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1983, Ser. No. 524,337

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **11 Claims**



1. Apparatus for reading and writing data signals along concentric tracks on a rotating, recording disc medium, with sector signals being prerecorded on the tracks, the apparatus comprising a pair of transducer heads for reading and writing data signals along predetermined, separate axes, the heads being oriented with respect to each other such that said axes form an acute angle therebetween, sample means connected to the heads for generating a servo tracking signal representative of the magnitude and direction of displacement of the heads from the centerlines of a predetermined pair of tracks as the heads read the sector signals, servo means for removably supporting said heads in a plane which is parallel to said recording medium and spaced from it by a predetermined distance selected to allow said heads to read signals from and record signals on said medium, the servo means including means responsive to a control signal and the servo tracking signal for selectively moving said heads incrementally in a radial direction with respect to said medium to read from and record on said medium in adjacent tracks.

4,561,029

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS OF THE CASSETTE TYPE

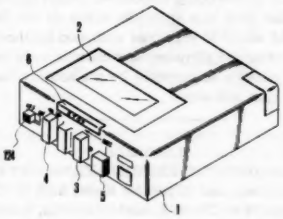
Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 282,077, Jul. 10, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 563,005

Claims priority, application Japan, Jul. 14, 1980, 55-95949; Jul. 14, 1980, 55-95950; Jul. 14, 1980, 55-95951

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—85 **22 Claims**



1. A recording and/or reproducing apparatus for use with a record bearing tape housed in a cassette, comprising:

a guide drum forming a generally cylindrical surface having at least one rotary head;

loading means for drawing the tape from the cassette and bringing the tape into contact with the surface of said guide drum, said loading means including first and second extracting members for drawing out the tape while in contact with the tape;

a first path for passage of said first extracting member;

a second path for passage of said second extracting member; and

said first and said second paths partially overlapping each other, and said first and said second extracting members being arranged for passing the overlapping portion of the paths one after the other during loading.

4,561,030

CASSETTE RECORDER WITH LOW-ENERGY PAUSE CONTROL

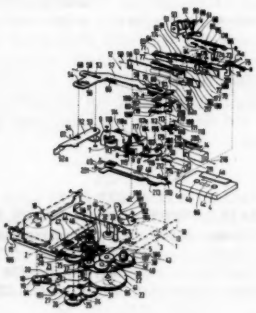
Lucas W. M. Schijven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,931

Claims priority, application Netherlands, Aug. 17, 1981, 8103831

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—93 **1 Claim**



1. A cassette recorder comprising:

a chassis,

a head bracket mounted on the chassis for movement, and a pressure roller and a magnetic head mounted on the bracket,

an ejection spring,

a cassette compartment for receiving a magnetic cassette, said compartment including a pivotably mounted ejection lever which upon insertion of a cassette is pivoted in an insertion direction to tension the ejection spring,

a capstan arranged for driving a magnetic tape in a cassette placed in the compartment, and drive means for the capstan and for transporting the tape past the magnetic head,

switching means for moving the head bracket toward the cassette,

latching means for keeping the ejection spring in the tensioned condition, and

means for actuating said latching means to release the ejection spring so as to pivot the lever in an ejection direction,

characterized in that said switching means comprises:

a play bracket movable to and from a play position,

a pause spring connected to said movable play bracket,

means for moving said play bracket toward the play position and tensioning the pause spring upon movement of said lever in the insertion direction,

a pause latch for latching the play bracket in the play position when the pause spring is tensioned,

means, including a solenoid and an electric switch, for releasing the pause latch independently of said latching means, said switch controlling said solenoid and actuating said drive means, and

means for coupling the play bracket to the head bracket for moving the head bracket away from but not out of the cassette in response to release of the pause latch while said latching means keeps the ejection spring in the tensioned condition.

4,561,031

AUTOMATIC CASSETTE LOADING APPARATUS

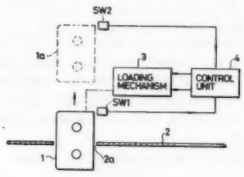
Minoru Tanabe, Daito, Japan, assignor to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Aug. 10, 1982, Ser. No. 407,272

Claims priority, application Japan, Aug. 11, 1981, 56-125670

Int. Cl.[4] G11B *5/008, 15/00*

U.S. Cl. 360—96.5 **6 Claims**



1. An automatic cassette loading apparatus comprising:

a motor;

first sensing means for detecting when a cassette is placed in a first position to energize said motor;

counting means for generating an output signal when a count representing time elapsed from the energization of said motor exceeds a predetermined value;

second sensing means for detecting when said cassette is moved to a second, tape-operating position;

means driven by said motor responsive to said first sensing means for moving said cassette from said first position to said second position, and for moving said cassette back at least to said first position and for de-energizing said notor thereafter when said output signal is generated prior to the detection of said cassette in said second position,

a cassette holder defining a passageway for a cassette to move between a front position and a rear position and movable between an upward position and a downward

position corresponding to said second position, wherein said first position corresponds to said cassette being located in said front upward position and said second position corresponds to said cassette being located in said rear downward position; and wherein said moving means comprises:

means driven by said motor for moving said cassette along said passageway from said front position to said rear position and for subsequently moving said cassette holder from said upward position to said downward position to place said cassette in said rear downward position and for moving said cassette back to said front upward position when said output signal is generated prior to the detection of said cassette in said rear downward position,

a toothed wheel driven by said motor;

a lock arm;

a spring-biased rotary assembly comprising a wheel having a toothed peripheral portion engageable with said toothed wheel and a toothless peripheral portion for disengaging the wheel from contact with said toothed wheel, a first cam engageable with said lock arm when said wheels are disengaged from contact with each other, and second and third cams, each of the second and third cams being formed with a pair of first and second camming faces symmetrical to a center of rotation of the assembly;

means including a first cam follower engageable with said second cam for moving said cassette from said front position to said rear position when engaging with the first camming face thereof and moving said cassette from said rear position to said front position when engaging with the second camming face thereof;

means including a second cam follower engageable with said third cam for moving said cassette holder from said upward position to said downward position when engaging with the first camming face thereof and moving said cassette holder from said downward position to said upward position when engaging with the second camming face thereof; and

a solenoid energizable in response to the output signal of said counter means for disengaging said lock arm from contact with said first cam to cause said toothed portion to engage with said toothed wheel.

3. In a cassette loading and unloading apparatus having a first switch means for detecting placement of a cassette in a first position, a motor means for moving said cassette from the first position to a second position, a second switch means for detecting wheh the cassette is placed in a second, tape-playing position, means for generating a signal when the placement of the cassette in said second position is not detected within a predetermined period elapsed from the placement of said cassette in said first position, and a solenoid means for moving the cassette from the second position at least to the first position in response to said signal, the improvement comprising a rotary assembly including:

a toothed wheel driven by said motor means;

a lock arm;

a spring-biased rotary assembly having a shaft;

a wheel coaxially mounted on said shaft and having a toothed peripheral portion engageable with said toothed wheel and a toothless portion for disengaging from said toothed wheel;

a first cam having first and second arc portions of approximately 180° for camming contact with said lock arm when said wheel is engaged with said toothed wheel and a notch located between said arc portions with which said lock arm engages for locking said wheel;

second and third cams each having a pair of substantially identical first and second camming faces corresponding to said first and second arc portions and symmetrical to a center of rotation of the assembly;

a first cam follower means for moving said cassette from the first position to an intermediate position in camming contact with the first camming face of the second cam during a first quarter turn of said wheel and moving said cassette from the intermediate position to said first position in camming contact with the second camming face of the second cam during a fourth quarter turn of said wheel; and

a second cam follower for moving the cassette from said intermediate position to said second position in camming contact with the first camming face of the third cam during a second quarter turn of said wheel and moving the cassette from said second position to said intermediate position in camming contact with the second camming face of the third cam during a third quarter turn of said wheel,

said solenoid means being responsive to said signal for disengaging said lock arm from the notch of the first cam to cause said wheel to reengage with said toothed wheel by spring action and allowing said cassette to be returned to said first position sequentially by the action of said second and first cam followers.

4,561,032

MAGNETOOPTIC REPRODUCING DEVICE

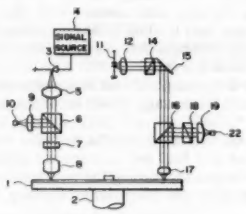
Kazuya Matsumoto, and Kiyonobu Endo, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,202

Claims priority, application Japan, Jun. 2, 1981, 56-85428; Jun. 10, 1981, 56-89261; Apr. 28, 1982, 57-72363

Int. Cl.⁴ G11B *11/00*

U.S. Cl. 360—114 **11 Claims**



1. A magnetooptic reproducing device comprising first means for causing a light beam linearly polarized in a predetermined direction to be incident on a magnetic recording medium on which information is magnetically recorded, second means for relatively increasing a polarization component in a direction perpendicular to a polarization component in said predetermined direction, as compared with the latter component, of the light reflected by or passed through said recording medium, wherein the polarization direction of the light reflected by or passed through said recording medium is rotated through a predetermined angle in a predetermined rotational direction in accordance with said information, and wherein said second means further rotates the polarization direction in said predetermined rotational direction, and third means for detecting the polarization direction of the light beam form said second means and reading the recording pattern on said recording medium.

4,561,033

PAD APPARATUS FOR MAGNETIC TAPE CASSETTE

Hideo Shirako, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,538

Claims priority, application Japan, Nov. 13, 1981, 56-169132[U]

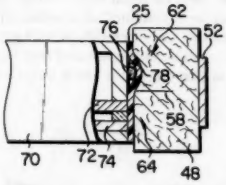
Int. Cl.⁴ G11B *15/62*

U.S. Cl. 360—130.33 **8 Claims**

1. A pad apparatus for a magnetic tape cassette for bringing a magnetic tape running in one direction into close contact

with a head of a tape recorder for recording or reproducing, comprising:

a pad having a surface which faces the surface of the head with the magnetic tape therebetween, said pad having a single incision therein at the central portion of the surface of the pad, said incision extending substantially parallel to



the running direction of the tape and dividing the surface of the pad into first and second pad sections, said first and second pad sections being substantially equal in area; and

urging means attached to the pad to urge the same so that the first and second pad sections are brought into close contact with the said first and second surface portions, respectively, of the head.

4,561,034

MAGNETIC RECORDING MEDIUM

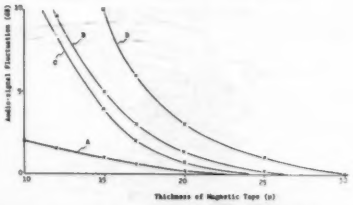
Naoto Akahane, Takatsuki; Yoshitake Yamaguchi, Nagaokakyo; Takeshi Matsuura, Otokuni, and Seiji Watatani, Takatsuki, all of Japan, assignors to Hitachi Maxell Ltd., Osaka, Japan

Filed Nov. 23, 1982, Ser. No. 444,359

Claims priority, application Japan, Nov. 24, 1981, 56-188713

Int. Cl.⁴ G11B *5/78*

U.S. Cl. 360—134 **8 Claims**



1. A magnetic recording medium which comprises a base film, a magnetic layer having an elastic modulus at 1% elongation of not less than 1,200 kg/mm^2 totally in both longitudinal and width directions which is higher than that of the base film, said magnetic layer being formed on one surface of the base film, and a backcoat layer having an elastic modulus at 1% elongation of not less than 1,200 kg/mm^2 totally in both longitudinal and width directions which is higher than that of the base film, said backcoat layer being formed on another surface of the base film, said magnetic recording medium having a total thickness of not more than 17μ.

4,561,035

METHOD AND APPARATUS FOR CLAMPING AND BALANCING ROTATABLE MEMBERS

Thomas W. McDorman, San Jose, and David K. Myers, Cupertino, all of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,336

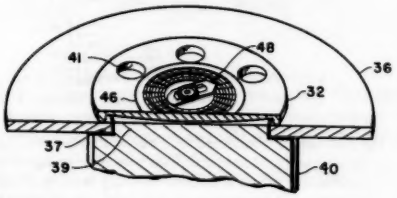
Int. Cl.⁴ G11B *25/04*

U.S. Cl. 360—137 **7 Claims**

1. In a rotatable assembly including a disc member having an axial pilot hole for engaging an end portion of a rotatable spindle formed with an annular shoulder having a depth corresponding to the thickness of the disc member for supporting the disc member so that a flat end surface of said end portion of the spindle is coplanar with a surface of the disc member, a means for clamping said disc member to said spindle and for balancing the rotatable assembly comprising;

a flexible circular clamping plate coaxially overlying the disc member and the end of said spindle, said plate having first and second surfaces, the first surface being planar and adjacent said spindle end and separated therefrom by a predetermined spacing, the center of said plate being thicker than the edge thereof by an amount substantially equal to said predetermined spacing;

a coaxial annular ring adjacent the edge of said clamping plate and between said first surface thereof and said disc member, said ring having a diameter greater than that of the axial pilot hole and less than the outside diameter of the annular shoulder on said spindle, said ring having a predetermined thickness substantially equal to said predetermined spacing for spacing said first surface of said plate from the adjacent surfaces of said disc member and said spindle end;



a calibration grid overlying said clamping plate, said grid having a central hole;

a bolt extending through said grid central hole, an axial hole in said clamping plate and engaging a tapped coaxial hole in said spindle, the tightening of said bolt drawing the central part of the first surface of said plate toward contact with the end surface of said spindle for applying equal clamping forces to said disc member, said bolt having a cylindrical shaped head with external threads thereon;

a balancing bar having an elongated central slot slideable over the externally threaded surface of said bolt head and having an indicating point at a first external end, said bar being constructed to contribute a zero balance correction when said threaded bolt head abuts the end of said slot proximal said external indicating point; and

a threaded nut engageable with the external threaded head on said bolt for clamping said balancing bar to said calibration grid and said clamping plate.

4,561,036

CHARGING GENERATOR CONTROLLING DEVICE

Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,286

Claims priority, application Japan, May 26, 1983, 58-92681; May 26, 1983, 58-92682

Int. Cl.⁴ H02H *7/06*

U.S. Cl. 361—20 **2 Claims**

1. A charging generator controlling device comprising:

(a) a charging generator having field and armature coils; rectifier means for rectifying AC outputs induced in said armature coils of said charging generator;

(b) a battery coupled to an output provided at an output terminal of said rectifier means;

(c) voltage regulator means including output transistor connected to said field coil of said charging generator in series between said battery and a ground terminal, said output transistor selectively interrupting a current in said field

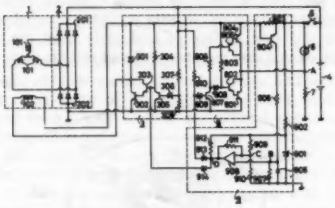
coil to maintain an output voltage of said generator at a predetermined value;

(d) a charge display lamp and a load connected in series, the series connection thereof being connected to a keyswitch in series between said battery and said ground terminal;

(e) current path switching means having an input coupled to an output of said charging generator and comprising first, second and third switching transistors, said first and second transistors being driven by said third transistor to energize said load instead of said charge display lamp when a potential at said output of said charging generator exceeds a second predetermined value lower than said first predetermined value; and

(f) protective means comprising:

(i) a capacitor connected in a discharge loop,



(ii) a transistor connected to a current path between said battery and said field coil, said transistor being rendered conductive when a current flowing from said battery through said keyswitch to said field coil of said charging generator exceeds a first predetermined value to thereby supply a current from said battery through said keyswitch to said capacitor, and

(iii) comparator means having an input coupled to said capacitor for generating an output for driving said third switching transistor of said current path switching means to energize said charge display lamp instead of said load and render said output transistor of said voltage regulator means nonconductive when the voltage of said capacitor exceeds a second predetermined value.

4,561,037

ELECTROSTATIC SPRAYING

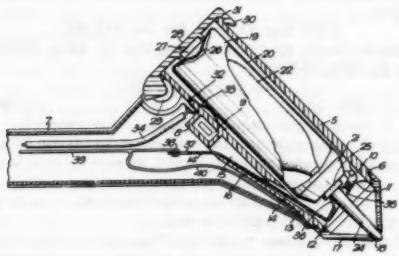
Colin G. MacLaine, and David J. Owen, both of Yarm, United Kingdom, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

Continuation-in-part of Ser. No. 589,221, Mar. 13, 1984. This application Jun. 29, 1984, Ser. No. 626,119

Claims priority, application United Kingdom, Mar. 25, 1983, 8308345; May 20, 1983, 8313959; Aug. 18, 1983, 8322308; Oct 5, 1983, 8326666

Int. Cl.[4] B05B *5/02*

U.S. Cl. 361—228 **10 Claims**



1. Portable electrostatic spraying apparatus including

(a) a spray nozzle,

(b) means to supply liquid to be sprayed to said spray nozzle,

(c) a low voltage power source,

(d) a high voltage generator powered by said low voltage power source, whereby rectified high voltage pulses may be produced across its output,

(e) a capacitor connected to said nozzle and to one side of said generator output, whereby said capacitor may be charged by said rectified high voltage pulses so that said nozzle may be maintained at a sufficiently high potential, with respect to the other side of said generator output, to cause electrostatic atomisation of said liquid at said nozzle,

characterised in that capacitor has a value below

$$\frac{2 \times 10^4}{V^2} \text{ pF},$$

where V is the average voltage, expressed in kilovolts, that said generator is capable of maintaining at said nozzle, and in that said capacitor is formed by the capacitance between a lead connecting said one side of the generator output to said nozzle and a lead connected to said other side of the generator output, said generator being capable of producing said high voltage pulses of such magnitude and frequency that the potential at said nozzle may be maintained at a sufficient value to cause electrostatic atomisation of the liquid but without corona discharge.

4,561,038

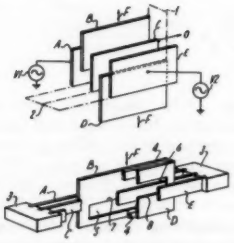
TRANSDUCERS

John S. Hatton; Roland N. Clarke, and Raj K. Saini, all of West Midlands, England, assignors to W & T Avery Limited, England

Filed Apr. 4, 1984, Ser. No. 596,558

Int. Cl.[4] H01G *7/00*

U.S. Cl. 361—280 **8 Claims**



1. A transducer comprising a capacitor including:

(a) a first set of at least threee, mutally spaced, rigid, electrically conductive plates,

(b) a second set of at least two, mutually spaced, rigid, electrically conductive plates,

(c) means mounting the two sets of plates with the plates of the second set interleaved with the plates of the first set, with spacing between the plates of the first set and the plates of the second set and with the plates of the two sets being movable relative to each other in a direction which maintains the spacing between the plates of the two sets substantially constant.

(d) means to permit an oscillating voltage to be applied across the outer plates of the first set, and

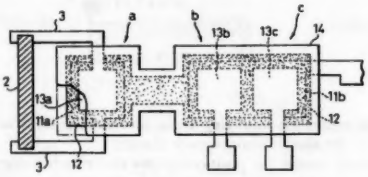
(e) means enabling an output voltage signal to be taken from an intermediate plate of the first set, the second set of plates having a shape and disposition such that a change in the relative positions of the two sets of plates produces a change in said output voltage signal, and such that as the interleaved region of one plate of the second set of plates increases, the interleaved region of another plate of the second set of plates decreases.

4,561,039

THICK FILM ELECTRONIC CIRCUIT

Michiyoshi Tsukahara, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Division of Ser. No. 372,196, Apr. 26, 1982, Pat. No. 4,476,518.
This application Mar. 16, 1984, Ser. No. 590,322
Claims priority, application Japan, Apr. 27, 1981, 56-63734
Int. Cl.[4] H01G 4/38; H01L 29/72
U.S. Cl. 361—328 10 Claims



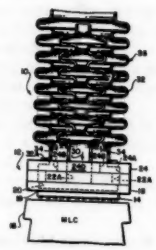
6. In a thick film printed circuit having a plurality of capacitors each having a dielectric layer lying between conductive layers with each of said layers being formed by thick film techniques, means for noting the insulative characteristics of several of said capacitors at the same time by initially forming the dielectric layers of each of the several capacitors in mutual contact and thereafter noting the insulative characteristics of the dielectric layer of one of said several capacitors.

4,561,040

COOLING SYSTEM FOR VLSI CIRCUIT CHIPS

Dean E. Eastman, Ossining, N.Y.; Jerome M. Eldridge, Los Gatos; Kurt E. Petersen, and Graham Olive, both of San Jose, all of Calif., assignors to IBM Corporation, Yorktown Heights, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,031
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—385 17 Claims



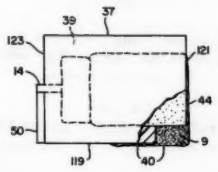
1. A system cooling an integrated circuit chip comprising:
(a) a heat-sink having one surface in intimate contact with the back surface of said integrated circuit chip, the front surface thereof making contact with a carrier for said integrated circuit chip;
(b) said heat-sink including a semiconductor plate having a plurality of spaced parallel grooves, which grooves extend along the surface opposite said one surface, for conducting liquid coolant so as to remove heat from said integrated circuit chip;
(c) a bellows including a first flexible member defining a flow path for said liquid coolant to said heat-sink; a second coaxial flexible member defining with said first member an annular flow path for said liquid coolant from said heat-sink;
(d) a coolant distribution means having spaced passageways for interconnecting the respective flow paths of said bellows to spaced points on said grooves of said heat-sink, said coolant distribution means being in stacked relationship with said heat-sink.

4,561,041

ESCAPSULATED CHIP CAPACITOR ASSEMBLIES

Harris L. Crowley, Jr., Simpsonville, and Everett T. Coyle, Jr., Greenville, both of S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 22, 1984, Ser. No. 643,184
Int. Cl.[4] H01G 9/05
U.S. Cl. 361—433 4 Claims



1. An encapsulated chip capacitor comprising
(a) a tantalum body of generally rectangular cross-section having front, rear, bottom, top and side surfaces with portions of said bottom and side surfaces being provided with a cathode metallization,
(b) an axial tantalum lead wire extending from said front surface,
(c) encapsulated insulating material substantially conformally molded around said tantalum body covering said front, top rear and side surfaces, of said body, and said bottom surface of said body except for a relatively small region thereof spaced from the respective side surfaces of said body whereby a slot is provided in said encapsulant communicating with and exposing a portion of said cathode metallization in said tantalum body,
(d) a copper metallization on a portion of the encapsulant covering the bottom surface and adjacent rear surface of said tantalum body and in said slot and on the cathode metallization of the tantalum body exposed by said slot to provide a cathode terminal,
(e) a thin metal strip abutting the encapsulant covering the front surface of said capacitor body having a width which is coextensive with a portion of said axial tantalum lead wire extending from said encapsulant and being welded thereto to provide an anode terminal.

4,561,042

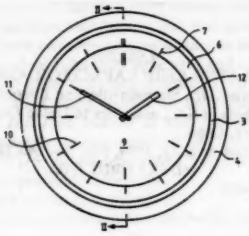
INSTRUMENT ILLUMINATING ARRANGEMENT

Hans-Joachim Wehner, Eisingen, and Wolfgang Burkhardt, Ispringen, both of Fed. Rep. of Germany, assignors to Pforzheimer Uhren-Rohwerke PORTA GmbH & Co., Pforzheim, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 599,965
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313463
Int. Cl.[4] G01D 11/28
U.S. Cl. 362—30 17 Claims

1. In an instrument illuminating arrangement for glare-free illumination of indicators such as characters of the display area of the instrument, especially for instruments with movable indicators such as hands or movable displays or electronically variable characters, said indicators having a light-emitting surface, an energy emitting excitation source disposed in the

vicinity of said display area and adapted to emit invisible energy and so arranged as to irradiate said light-emitting surface,



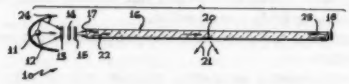
said light emitting surface being adapted to be excited by said invisible energy so as to emit light in the visible range.

4,561,043

DECORATIVE LIGHT DISPLAY

Gary J. Thompson, 8353 Minuet Pl., Panorama City, Calif. 91402

Filed Sep. 27, 1984, Ser. No. 654,983
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 **2 Claims**



1. A decorative light display comprising:
a light source emitting light rays;
an elongated, rigid and non-flexible light conducting member of constant cross section receiving said light rays at a selected end and its opposite end having a reflective material for redirecting said light rays back through said member;
said light conducting member of constant cross section provided with an external peripheral opaque material and a plurality of openings constituting windows through said material at selected locations along the length of said member for emitting light;
a dichoic filter disposed between said light source and said member selected end;
said member selected end is polished to facilitate light ray passage and introduction into said member;
said member is a translucent rod and said openings are etched portions exposed through said opaque material; and
said member is a rod having said opaque material a mirrored coating with said openings therethrough at predetermined locations to emit light for decorative purposes.

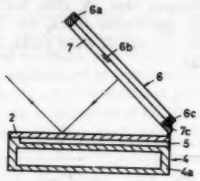
4,561,044

LIGHTING DEVICE FOR A DISPLAY PANEL OF AN ELECTRONIC DEVICE

Takashi Ogura; Toshihide Hirohara; Masaaki Matsunaga; Kiyoshi Kamiya, and Tetsuo Tanaka, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 663,689
Claims priority, application Japan, Oct. 28, 1983, 58-202182; Nov. 15, 1983, 58-176137; Dec. 28, 1983, 58-245186
Int. Cl.[4] H05B *33/12*
U.S. Cl. 362—84 **6 Claims**

1. An improved lighting device for an electronic device having a body comprising a case provided with an electric circuit therein, a liquid crystal display panel provided on the case and a mirror for watching an image on the liquid crystal display panel by the light passing through the display panel, wherein the improvement comprising:
an electroluminescence device detachably provided in the case;



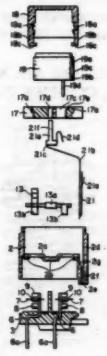
first means for supplying a current from the electric circuit to the electroluminescence device;
second means for positioning the electroluminescence device at a position adjacent the liquid crystal display panel so as to light the panel.

4,561,045

ILLUMINATED DISPLAY ASSEMBLY

Hiroyuki Nishi; Mitsuji Hayashi, both of Nagaokakyo, and Motoyuki Tomizu, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 18, 1984, Ser. No. 601,764
Claims priority, application Japan, Jan. 27, 1983, 58-58586[U]
Int. Cl.[4] F21V *17/00*
U.S. Cl. 362—368 **4 Claims**



1. An illuminated display assembly comprising
a case member
a light emitting member removably supported within said case member,
a socket base member,
a contact switching means
a cap member housing said light emitting member therewithin and including at least one engaging leg to be engaged with the socket base member,
connection means carried by the socket base member for disengageably contacting a connection terminal of said light emitting member,
housing means for supporting said socket base member for a slidable movement and for supporting said contact switching means therewithin, wherein said socket base member is adapted to actuate said contact switching means by depression of said cap member, and
wherein said connection means has an upper end which is inserted in a hole formed within said socket base member

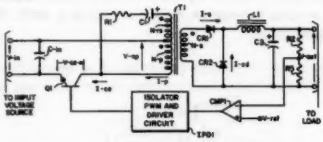
and a lower end of which extends outwardly through said housing.

4,561,046

SINGLE TRANSISTOR FORWARD CONVERTER WITH LOSSLESS MAGNETIC CORE RESET AND SNUBBER NETWORK

Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 22, 1983, Ser. No. 564,261
Int. Cl.[4] H02P 13/22
U.S. Cl. 363—21 **8 Claims**



1. A switching isolated forward converter for use in a power system which includes a load and a source of input voltage having first and second terminals, said converter comprising:

switching means connected to said first input voltage source terminal;

a transformer having primary and secondary windings, said primary winding being connected to said second input voltage source terminal and to said switching means;

a protection circuit connected across said primary winding; and

a secondary circuit connected between said secondary winding and said load;

said switching means being operative to electrically connect said primary winding across said input voltage source, whereby primary current of a first characteristic flows through said primary winding;

said primary winding being operative in response to said primary current of a first characteristic to provide magnetic flux of a first characteristic;

said protection circuit being operative in response to said magnetic flux of a first characteristic to store primary energy of first characteristic;

said secondary winding being operative in response to said magnetic flux of a first characteristic to provide secondary voltage of a first characteristic;

said secondary circuit being operative in response to said secondary voltage of a first characteristic to provide output current of a first characteristic;

said switching means being further operative to electrically disconnect said primary winding from said input voltage source;

said primary winding being operative in response to said disconnection to provide primary current of a second characteristic said primary winding being operative in response to said primary current of a second characteristic to provide magnetic flux of a second characteristic;

said protection circuit being operative in response to said magnetic flux of a second characteristic and said stored primary energy of a first characteristic to store primary energy of a second characteristic;

said secondary winding being operative in response to said magnetic flux of a second characteristic to provide secondary voltage of a second characteristic;

said secondary circuit being operative in response to said secondary voltage of a second characteristic to provide output current of a second characteristic;

said protection circuit being further operative to release said stored primary energy of a second characteristic, whereby primary current of a third characteristic flows through said primary winding;

said primary winding being operative in response to said primary current of a third characteristic to provide magnetic flux of a third characteristic;

said secondary winding being operative in response to said magnetic flux of a third characteristic to provide secondary voltage of a third characteristic; and

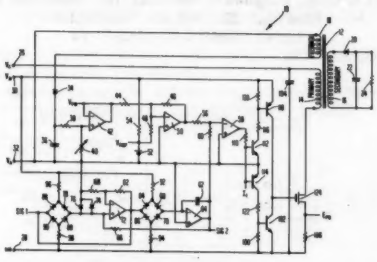
said secondary circuit being operative in response to said secondary voltage of a third characteristic to provide output current of a third characteristic.

4,561,047

SWITCHING REGULATOR CURRENT LIMIT CIRCUIT

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, King of Prussia, Pa.

Filed Dec. 19, 1983, Ser. No. 562,892
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **13 Claims**



1. In a voltage regulator comprising a transformer having a primary coil for receiving an input voltage and a secondary coil for providing an output voltage of predetermined magnitude, means for limiting the magnitude of a short circuit current in said secondary coil comprising:

a. means for sensing current magnitude in said primary coil;

b. means for setting a current limit level based upon a predetermined maximum current magnitude in said primary coil;

c. means for sensing secondary coil voltage magnitude;

d. means for reducing said current limit level based upon a sensed reduction of said secondary coil voltage; and

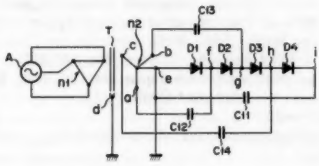
e. means for removing the input voltage from said primary coil when the magnitude of said sensed primary coil current exceeds said current limit level as reduced by said sensed reduction of said secondary coil voltage magnitude.

4,561,048

MULTIPLE STEP-UP RECTIFIER CIRCUIT

Yoshio Takamura, Yokohama, and Akira Nakajima, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,962
Claims priority, application Japan, Oct. 22, 1982, 57-185713
Int. Cl.[4] H02M 7/19
U.S. Cl. 363—60 **6 Claims**



1. A multiple step-up rectifier circuit comprising:

transformer means having a primary winding connected to

an AC signal source of at least three phases, a star-connected secondary winding having a neutral point connected to ground, and at least three output terminals;

a series circuit including a plurality of rectifying means connected in series so as to be biased in the same direction;

at least one first capacitor means connected between two terminals of said series circuit; and

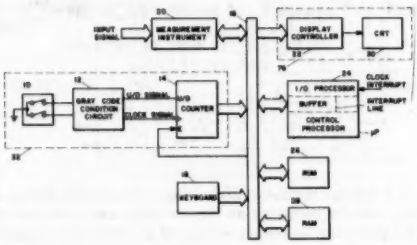
at least second, third and fourth capacitor means each of which has one end connected to a corresponding one of said output terminals of said secondary winding and the other end connected to a corresponding one of first, second and third connecting points of said rectifying means.

4,561,049

CONTROL SYSTEM EMPLOYING A ROTARY KNOB

Sam M. Deleganes, Aloha, and Steven C. Den Beste, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1983, Ser. No. 478,140
Int. Cl.[4] G05B *9/02*; G06F *3/14*
U.S. Cl. 364—130 **5 Claims**



1. A control system connectable to a signal measurement and display instrument, comprising:

means for generating data values representative of the angular displacement and direction of rotation of a rotary control means;

means for reading said data values at a predetermined rate to provide updated status and displacement values; and

means responsive to said status and displacement values for generating commands which establish operating conditions for said measurement and display instrument,

means for reading said data wherein said means for generating data values includes a Gray code generator coupled to said rotary control means, a Gray code condition circuit coupled to said Gray code generator for producing an increment/decrement signal and a clock, and an up/down counter coupled to said Gray code condition circuit, wherein said up/down counter produces said data values in response to said increment/decrement signal and said clock.

4,561,050

METHOD OF DETERMINING COORDINATE SYSTEM IN MACHINING CENTER

Hideaki Iguchi, Konan; Takayoshi Sakai, Kagamihara, and Hajime Ohashi, Inuyama, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Aichi, Japan

Filed Nov. 16, 1982, Ser. No. 442,085
Claims priority, application Japan, Nov. 25, 1981, 56-188953
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—167 **4 Claims**

3. A machining center coordinate determining arrangement comprising:

a spindle for rotating a tool coupled thereto for machining a workpiece, said spindle having an axis;

a plurality of tools of different lengths in the direction of said spindle axis;

means for coupling a tool of said plurality of tools to said spindle;

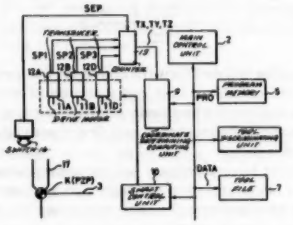
means for resetting a particular tool coupled to the spindle to a zero point which is the origin of a mechanical coordinate axis after a tool exchange has been effected;

means for detecting the mechanical coordinate values of a tool coupled to said spindle with respect to said mechanical zero point;

a tool file memory for storing length data indicative of the length of each tool of said plurality of tools;

a program memory for storing a machining program defined with respect to said program zero point;

means for setting a reference position with respect to said program zero point at a predetermined position on a coordinate system having an origin coinciding with the program zero point;



means for positioning a tool, coupled to said spindle, so as to coincide with said reference position;

means for computing the mechanical coordinate values of said reference position with respect to said mechanical zero point from information provided by said detecting means;

means for computing the mechanical coordinate values of said program zero point from said mechanical coordinate values of said reference position;

means for correcting, when a tool is exchanged, the mechanical coordinate values of said program zero point in accordance with a difference of length between consecutively used tools by reading tool length data from said tool file memory; and

means for executing said machining program using the resulting corrected mechanical coordinate values.

4,561,051

MEMORY ACCESS METHOD AND APPARATUS IN MULTIPLE PROCESSOR SYSTEMS

Paul K. Rodman, Ashland; Joseph L. Ardini, Jr., Needham, and David B. Papworth, Framingham, all of Mass., assignors to Prime Computer, Inc., Framingham, Mass.

Filed Feb. 10, 1984, Ser. No. 578,797
Int. Cl.[4] G06F *13/00, 15/16*
U.S. Cl. 364—200 **12 Claims**

1. A multiprocessor data processing system comprising

a main memory having a plurality of addressed locations,

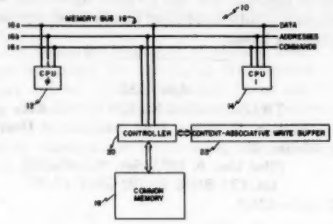
at least a first and a second processor, each of which can independently read, modify, and write data at said addressed locations,

a content-associative buffer means having a plurality of content addressable data words, and

control means connected to said processors, to said memory, and to said buffer means for controlling said read and write operations,

said control means employing, in response to a locking instruction from a said processor, said content-associative

buffer means for altering the otherwise normal sequence of memory write instructions,



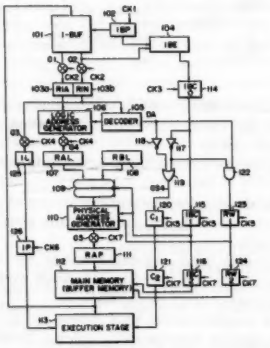
whereby said processors can concurrently access and write at the same main memory addressed location.

4,561,052

INSTRUCTION PREFETCH SYSTEM

Haruo Tateno, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 7, 1982, Ser. No. 415,438
Claims priority, application Japan, Sep. 18, 1981, 56-147210
Int. Cl.⁴ G06F *13/00, 9/16*
U.S. Cl. 364—200 **2 Claims**



1. A pipelining information processor comprising:

(a) a memory;

(b) an instruction buffer coupled to said memory so as to receive prefetched instructions from said memory;

(c) means for executing instructions;

(d) a memory access unit including:

(i) an address generator coupled to receive an input from said instruction buffer and to generate therefrom a logical address output; and

(ii) means for address modification receiving a logical address as an input and providing a physical address output to said memory;

(e) means for fetching an instruction from said instruction buffer to said means for executing;

(f) means, operating in parallel with said means for fetching, for providing an input to said means for address modification including:

(i) first means to detect if the input provided to said address generator requires a memory access to obtain an operand, and to cause said means for providing to couple the output of said address generator to said means for address modification if the input requires a memory access; and

(ii) second means to detect a need to prefetch an instruction to said instruction buffer, and to cause said means for providing to couple an address of an instruction to be prefetched to said means for address modification, if said second means to detect detects said need and if said first means to detect does not detect that the input provided to said address generator requires a memory access to obtain an operand, whereby fetching of an instruction for execution and prefetching an instruction to said instruction buffer occurs simultaneously; and

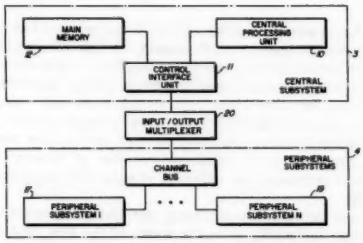
(g) control means for sequentially moving instruction addresses through said means for providing, said instruction buffer, said address generator, and said means for address modification in response to a series of clock pulses in such a manner that address generation, address modification, instruction fetching, and instruction execution occurs in parallel on successive instruction.

4,561,053

INPUT/OUTPUT MULTIPLEXER FOR A DATA PROCESSING SYSTEM

Knute S. Crawford, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Continuation of Ser. No. 222,460, Jan. 5, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,659
Int. Cl.⁴ G06F *3/00*
U.S. Cl. 364—200 **4 Claims**



1. In a data processing system including at least one central subsystem and a plurality of peripheral subsystems wherein data signal groups are transferred between a central subsystem and a selected peripheral subsystem as a result of an exchange of a plurality of signal groups between said central subsystem and said selected peripheral subsystem, said signal groups including control signal groups and said data signal groups, an input/output apparatus, coupling said central subsystem and said peripheral subsystem, comprising:

(a) first input means for receiving signal groups from said central subsystem to distribute said signal groups within said input/output apparatus;

(b) first output means, coupled to said first input means, for transmitting signal groups to said selected peripheral subsystem;

(c) second input means for receiving signal groups from said peripheral subsystem;

(d) second output means for transferring signal groups to said central subsystem; and

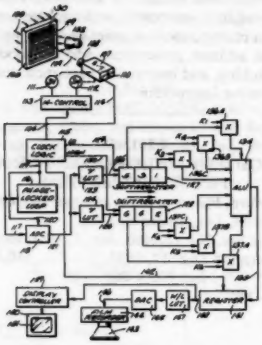
(e) processor means, coupled to said first and second input means and said second output means, for storing file signal groups from said central subsystem in response to a first preselected signal group from said peripheral subsystem, said processor means producing address signal groups from said file signal groups, said processor means delivering said address signal groups to said second input means in response to second preselected signal groups, said address signal group determining a location in said central subsystem of said data signal group involved in said transfer, said processor means providing that said first input and said first output means operate independently of said second input and said second output means.

4,561,054

FILM-BASED DUAL ENERGY RADIOGRAPHY

Edward W. Andrews, Brookfield, and Thomas W. Lambert, Dousman, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1983, Ser. No. 541,772
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 364—414 **11 Claims**



1. Apparatus for combining two X-ray images of an anatomical region recorded simultaneously on film where one of the images corresponds to having exposed said region primarily to a high energy spectral band in a broad energy spectrum X-ray beam and the other image corresponds to having exposed said region primarily to a relatively lower energy spectral band in said broad spectrum and said images on the film are represented by a sequence of alternative lines of picture elements (pixels) composing the different images, said apparatus comprising:

means for optically scanning said film transversely to said lines repeatedly over the width of the film, and detector means responsive to said scanning by producing alternating amplitude analog signals representative of the intensities of the pixels in the alternate low energy and higher energy image lines,

clock pulse generating means coupled to said detector means and operative to produce clock pulses in synchronism with the alternate low and high energy analog signals,

analog-to-digital converter (ADC) means having input means for said analog signals and having output means, said ADC means responding to occurrence of clock pulses by converting the corresponding analog pixel signal to alternate low and high energy digital pixel signals,

first and second multiple stage shift registers having input means and means coupling said input means, respectively, to the output means of said ADC means, said shift registers responding to occurrence of alternate clock pulses corresponding to low and high energy analog signals, respectively, by entering a low and high energy digital pixel signal in the first stage of each register and by shifting from stage to stage in response to occurrence of successive clock pulses,

spatial interpolation circuit means for obtaining substantial coincidence between low and high energy pixels in the adjacent lines on the film, said circuit means comprising sets of digital signal multipliers for each register, said multipliers in a set having inputs coupled to the stages of said registers and an input for a spatial weighting coefficient signal and each multiplier having an output, said multipliers being operative to multiply the signals presently in the low and high energy shift register stages by said weighting coefficient signals, and,

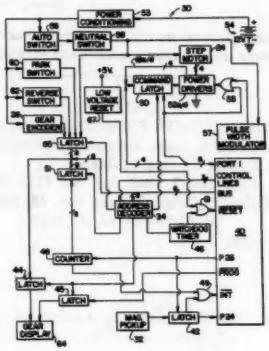
circuit means for performing arithmetic and logic operations and having inputs coupled to the outputs of the multipliers and having output means and operative to combine the weighted pixel signals from the multiplier sets to produce composite interpolated low and high energy pixel signals and said circuit means is further operative to subtract related high and low energy pixel signals and to output a sequence of difference pixel signals for composing a single difference image.

4,561,055

TRANSMISSION CONTROLLER

Kevin D. McKee, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 6, 1982, Ser. No. 446,915
Int. Cl.⁴ B60K *41/08*; G06F *15/50*
U.S. Cl. 364—424.1 **13 Claims**



1. A vehicle transmission control system comprising:

an engine-driven transmission for transmitting torque at selected gear ratios;

manual input means for manually generating shift control signals;

shift means for shifting the transmission among its gear ratios in response to manually and automatically generated shift control signals;

operator-actuatable mode selecting means for selectively placing the control system in an automatic control mode and in a manual control mode; and

a control unit coupled to the shift means and to the mode selecting means for automatically generating shift control signals as a function of sensed vehicle and transmission operating parameters when the control system is in its automatic control mode, the control unit including mode switching means for automatically switching the control system from its automatic to its manual control mode in response to selected conditions without actuation of the mode selecting means.

4,561,056

ELECTRONIC CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Takeshi Hirayama, Mito; Matsuo Amano; Takao Sasayama, both of Hitachi, and Shirou Baba, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,387
Claims priority, application Japan, Oct. 16, 1981, 56-164125
Int. Cl.⁴ F02P *5/08*; F02M *7/16*; F02B *3/10*; G05B *15/02*
U.S. Cl. 364—431.05 **10 Claims**

1. In a control apparatus for an internal combustion engine comprising a plurality of sensors for producing signals representative of operating conditions of said engine, a plurality of actuators for controlling the operation of said engine, and signal processing means responsive to the signals from said sensors to perform processing operations and produce signals

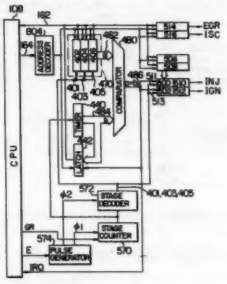
for controlling said actuators, the improvement wherein said signal processing means comprises:

(a) at least one reference register for storing data representing a given time for controlling the operation of said engine;

(b) counting means for measuring an elapsed time;

(c) comparing means for comparing the contents of said reference register and said counting means and for producing an interrupt signal when equality between said contents is detected;

(d) means for storing a condition existing when said interrupt signal is generated;



(e) central processing means for reading said existing condition from said storing means each time said interrupt signal is generated and for computing, in accordance with said existing condition, when and how a control condition is to be changed with respect to a particular one of a plurality of controlled systems selected on the basis of said existing condition to generate a control signal; and

output register means for storing said control signal and for applying the same to a corresponding one of said plurality of actuators when a set given time is reached.

4,561,057

APPARATUS AND METHOD FOR MONITORING MOTION OF A RAILROAD TRAIN

John E. Haley, Jr.; Michael J. Lynch, and Jeffrey S. Rosenberg, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 14, 1983, Ser. No. 485,079

Int. Cl.[4] G11B *5/00*; G06G *15/48*; B60L *3/12*

U.S. Cl. 364—436 **18 Claims**

1. An apparatus for monitoring the motion of a railroad train, comprising:

on-board electronic means, connectible to an electrical train line of a railroad train for retention on the railroad train, for determining speed, rate of change of speed and distance traveled data of the railroad train, said electronic means including:

display means, visible to an operator of the railroad train when said electronic means is connected to the train line, for visually displaying speed, rate of change of speed and distance traveled data;

first memory means for storing information in said electronic means;

first computer means, responsive to a signal representative of the motion of the railroad train, for computing and displaying through said display means real time speed, rate of change of speed and distance traveled data and for transferring to said memory means information related to said real time data so that a history of said information is compiled from which said real time data can be later analyzed; and

first communication means, responsive to said computer means, for providing a first communication path over which said information can be transferred from said electronic means; and

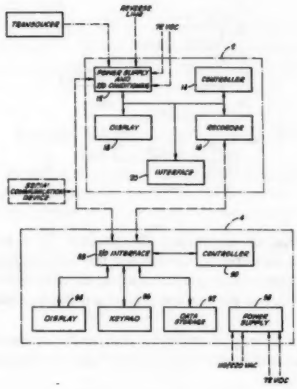
portable means, connectible to said electronic means, for copying, either directly from said first memory means or through said first communication means, said history from said electronic means when said electronic means is retained on the railroad train and for transferring said history to a location remote from the railroad train and said electronic means, said portable means including:

hand-carried means for transporting said portable means;

second communication means, mounted in said hand-carried means, for connecting with said first communication means;

third communication means, mounted in said hand-carried means, for connecting with said first memory means;

second memory means, mounted in said hand-carried means, for storing information received through either said second communication means or said third communication means;



fourth communication means, mounted in said hand-carried means and connected to said second memory means, for providing a communication path to said second memory means; and

second computer means, mounted in said hand-carried means and connected to said second, third and fourth communication means, for controlling a selectable one of said second and third communication means to receive said history through the selected one thereof and for controlling said fourth communication means to send said received history to said second memory means for storage therein, said second computer means selecting said second communication means when said first communication means is connected thereto and said second computer means selecting said third communication means when said first memory means is connected thereto.

4,561,058

METHOD OF AND APPARATUS FOR MEASURING DISTANCE IN NUMERICALLY CONTROLLED MACHINE TOOLS

David R. McMurtry, 'Undercroft', Tabernacle Pitch, Wotton-Under-Edge, Gloucestershire, England

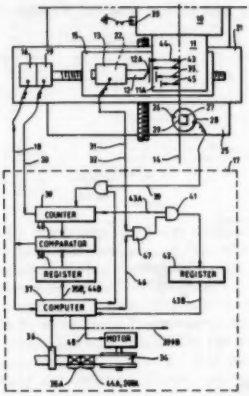
Continuation of Ser. No. 229,052, Jan. 27, 1981, Pat. No. 4,451,892. This application May 7, 1984, Ser. No. 608,078

Claims priority, application United Kingdom, Jan. 31, 1980, 8003285

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—474 1 Claim



1. A method of machining the surface of a workpiece mounted on a numerically controlled machine tool, said machine tool having a cutting tool attached thereto which can be displaced relative to the surface of said workpiece, comprising the steps of

(1) storing a first signal corresponding to the desired distance of the finished machined surface of said workpiece from a datum plane;

(2) generating a second signal corresponding to the actual distance of said cutting tool from said datum plane;

(3) moving at least one of said cutting tool and said workpiece with respect to each other to a position at which said first signal is equal to said second signal to machine the surface of said workpiece to a first distance from said datum plane at which said first signal is equal to said second signal, said first distance being short of said desired distance due to relative defection between said tool and said workpiece;

(4) separating said cutting tool from said workpiece;

(5) sensing the magnitude of said first distance and generating a third signal corresponding thereto;

(6) generating a fourth signal corresponding to the algebraic sum of said third and first signals, said fourth signal corresponding to the amount by which said first distance is short of said desired distance;

(7) generating a fifth signal corresponding to the difference between said first signal and said fourth signal; and

moving at least one of said cutting tool and said workpiece with respect to each other to machine said workpiece to a distance from said datum plane at which said second signal equals said fifth signal, said cutting tool thereby machining the surface of said workpiece to the desired distance from said datum plane.

4,561,059

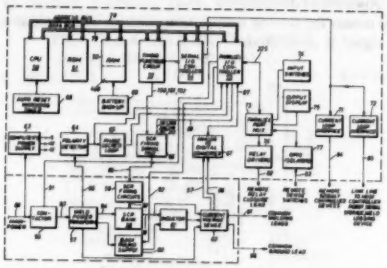
MICROPROCESSOR CONTROLLED WELDING APPARATUS

Clint A. Davis, League City, and Melvin P. Trail, Houston, both of Tex., assignors to Beckworth Davis International, Inc., Houston, Tex.

Filed Feb. 24, 1983, Ser. No. 469,519

Int. Cl.[4] G06F *15/46;* B23K *9/20*

U.S. Cl. 364—477 20 Claims



1. A microprocessor-controlled arc-welding apparatus, comprising:

a three-phase transformer, the three phase transformer having at least one primary winding and having three secondary windings, the primary winding being adapted for coupling to a source of alternating current ("AC") electrical energy, each secondary winding being connected to a common ground lead;

at least three silicon controlled rectifiers ("SCR's"), each SCR being connected between a secondary winding of the three-phase transformer and a common welding lead having a common direct current ("DC") polarity, each SCR being responsive to a gating signal to rectify an AC signal applied to its associated secondary winding by conducting direct current during a portion of an AC phase when the SCR is forward biased subsequent to the point in time when the gating signal enables the SCR, the SCR's being mutually cooperable to generate a welding signal between the common welding lead and the common ground lead, the welding signal having a DC voltage with an average magnitude which is determined by the portion of the AC phase that the SCRs are enabled by the gating signal;

a sensor coupled to the common welding lead for directly sensing the welding signal;

an input/output controller, the input/output controller being coupled to the sensor, the input/output controller being coupled to the SCR's;

a memory; and,

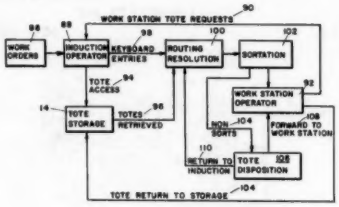
a microprocessor, the microprocessor being coupled to the input/output controller and to the memory, the microprocessor being adapted to read welding data signals from the sensor through the input/output controller, the microprocessor, in accordance with a program stored in the memory, being operable to compare the welding data signals from the sensor with control data in memory, the micro processor being operable to signal the SCRs and provide gating signals in accordance with a program stored in memory which enables the SCRs for a portion of the AC phase so that the welding signal has a DC voltage which is determined by the microprocessor;

the microprocessor-controlled welding apparatus being capable of welding in a plurality of selectable arc-welding modes by selecting an appropriate program in memory, the microprocessor-controlled welding apparatus being capable of changing between a constant current mode and a constant voltage mode without rewiring the apparatus.

4,561,060
TOTE DIRECTOR

Robert F. Hemond, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 344,174, Jan. 29, 1982, Pat. No. 4,484,289. This application Jul. 16, 1984, Ser. No. 631,081
The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.[4] G06F *15/24*
U.S. Cl. 364—478 39 Claims



2. A system for controlling, and collecting real time data relative to, the flow or work materials within a work area including a plurality of work stations at which the materials are processed, said system comprising:

a central dispatch station;

station signaling means at each of the work stations for indicating to said central dispatch station that an unprocessed work material is requested at the work station;

conveyor means for transporting unprocessed work materials from said central dispatch station directly to the work stations, said conveyor means including means for directing each work material to a particular work station;

memory means for storing a first data record in real time relating to each work material transported by said conveyor means, each first data record including a material number unique to the work material, a station number unique to the work station to which the material is to be transported, and a type number unique to the material type, said memory means further including means for storing a second data record for each work station, each second data record including information indicating of which material types can be processed at the work station;

computer circuit means coupled to said conveyor means and to said memory means for verifying that each work material is to be delivered only to a work station capable of processing the work material, and for controlling said directing means in response to the station numbers to deliver each of the transported materials only to a work station capable of processing the work material; and

display means coupled to said memory means for selective real time displaying of the first data records to provide real time information relating to materials in process.

4,561,061
METHOD OF TRACING/RECORDING IMAGE LINES AND APPARATUS THEREFOR

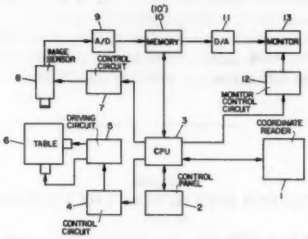
Takashi Sakamoto; Tetsuo Sano; Eiji Kodama, and Masamichi Choh, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Mar. 26, 1982, Ser. No. 362,101
Claims priority, application Japan, Apr. 6, 1981, 56-52106
Int. Cl.[4] G05B *1/00*; G06F *15/40*
U.S. Cl. 364—550 7 Claims

1. A method for producing an accurate outline of a selected image portion in a picture, said method comprising manually tracing the outline of the image portion to produce outline coordinate data approximately representing the image outline, storing the approximate coordinate data produced by the manual tracing, automatically scanning overlapping image outline portions with an image sensor, and producing accurate image outline coordinate data, wherein the accurate image outline coordinate data is produced by the steps of

moving the receiving surface of the image sensor to selected approximate coordinate data positions as determined by the manual tracing,

projecting the image outline area surrounding each approximate coordinate data position onto the receiving surface of the image sensor,



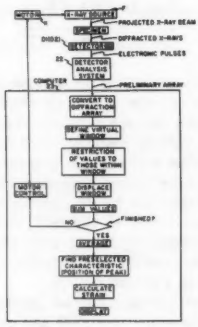
comparing the signal level received from each approximate coordinate data position with the average signal level received from the area surrounding that coordinate data position, and

assigning accurate image outline coordinate data based on differences between the coordinate data position signal level and the average signal level of the surrounding area.

4,561,062
STRESS MEASUREMENT BY X-RAY DIFFRACTOMETRY

Crighton M. Mitchell, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources Canada, Ottawa, Canada

Filed Feb. 18, 1983, Ser. No. 467,955
Int. Cl.[4] G01N *15/00*; G01M *5/00*
U.S. Cl. 364—555 19 Claims



1. In a method of obtaining a diffraction line intensity distribution in a surface area of a polycrystalline specimen by X-ray diffraction including

(a) projecting an X-ray beam onto said area,

(b) receiving in a position sensitive detector X-rays diffracted by crystal lattice planes in said area,

(c) converting the X-rays received in said detector into a diffraction array of intensity values as a function of diffraction angle,

(d) step scanning the projected beam angularly about said area to generate a sequence of said arrays, said step scanning being such that the angle between said X-ray beam

and a normal to said area changes with each step relative to the angle between the centre of width of the detector and said normal, and

(e) averaging the intensity values of said arrays for each of a series of said diffraction angles;

the improvement comprising

(f) restricting the intensity values so averaged to those obtained from a virtual window in the detector that is such that the centre of width of the window is coincident with the diffracted beam received from a set of said lattice planes normal to a chosen direction, and

(g) displacing said virtual window relative to said diffraction array for each successive scanning position to obtain a resultant diffraction line intensity distribution.

4,561,063

APPARATUS FOR IDENTIFYING THE POSITION OF A BODY

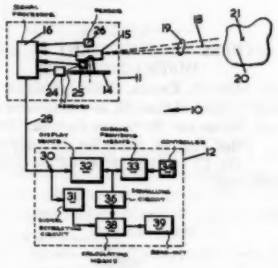
Robert L. Craig, Glasgow; Iain Hunter, Beith, and Paul D. Packard, Glasgow, all of Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Feb. 2, 1983, Ser. No. 463,261

Claims priority, application United Kingdom, Feb. 9, 1982, 8203643

Int. Cl.[4] G01B *11/00*

U.S. Cl. 364—559 **4 Claims**



1. Apparatus for identifying the position of a body relative to a datum comprising a first station at which there is located a raster-scan imaging device having a field of view with at least one degree of rotational freedom, sensor means for measuring the angular position of the device with respect to said datum, a signal processor for adding the output of the sensor means to the video signal delivered by the imaging device at a position in the raster-scan which, in playback, does not obscure the video picture generated by the device from radiation received by its field of view, and means for delivering the output of the signal processor to a second station;

and said second station comprises means for receiving the output of the signal processor and extracting therefrom the output of the sensor means as a measure of the angular position of the imaging device with respect to said datum, a raster-scan playback display device with means for providing an operator-controllable electronic cursor thereon, signalling means for identifying the cursor position with respect to the raster-scan of the playback device, and a calculating means for calculating from the measure of the imaging device angular position with respect to the datum and from the identified position of the cursor with respect to the raster-scan the angular position relative to said datum of a body which is identified in the field of view by location of the cursor on the playback display device.

4,561,064

NON-CONTACTING DISTANCE MEASURING SYSTEM

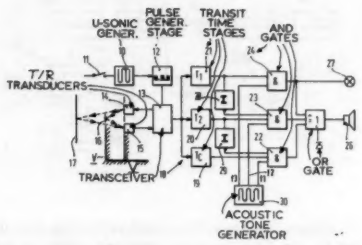
Gerhard Brüggen, Löwenstrasse 95, D-7000 Stuttgart 70; Dieter Karr, Hans Reyhin 47, D-7250 Leonberg, and Wolfgang Rottler, Kopernikusweg 2, D-7145 Markgröningen, all of Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,467

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3207950

Int. Cl.[4] G08G *1/00*

U.S. Cl. 364—561 **15 Claims**



1. In combination with a vehicle (V), a non-contacting distance measuring system for determining the distance between a transmitting object and a reflecting object (17) having an ultrasonic pulse train beam transmitter (14) for projecting an ultrasonic pulsed beam train from the rear portion of the vehicle (V) to an obstruction forming said reflectig object (17);

means (15, 13) for receiving reflected signals from said reflecting object, including a beam receiver (15),

said beam transmitter (14) and receiver (15) being located externally of the body of the vehicle (V);

transit time determination means (18) coupled to the pulse projecting means in said beam transmitter, and including means for determining the time of transit of the pulses of the beam from said transmitter to said reflecting object to determine said distance when the transit time, per unit distance, is known;

indicator means (26, 27) for providing different and discrete output indications, said indicator means furnishing an output indication when said distance drops below a pretermined value;

a reflector (16) located on the vehicle and spaced at a prdetermined distance from said beam transmitter (14) in a portion of the beam in the path thereof;

said transit time determination means (18) comprising a plurality of transit time stages (19, 20, 21) responding, in steps, to different transit time periods of the beam from said transmitter (14) to, respectively, said reflector (16) and the obstruction forming said reflecting object (17), and return to said receiver,

one of said stepped transit time stages (19) being associated with the transit time of signals from said transmitter (14) to said reflector (16) and received in said receiver (15);

and function testing logic means (22, 23, 24, 25, 29, 30) connected to and controlled by said stepped transit time stages and responsive to the portion of the transmitted beam which is reflected by said reflector (16) and further responsive to the beam reflected from said obstruction forming said reflecting object (17) and received in said receiver (15), said function testing logic means being connected to control the discrete output provided by the indicator means to provide a first characteristic of a functionality test of the system upon energization of the system and reception of reflected signals from said reflector (16), and providing an output of a discretely different characteristic by said indicator means upon reception of signals from said obstruction forming said reflecting object (17),

and disabling indication of said first characteristic by said indicator means.

4,561,065

ARITHMETIC PROCESSING DEVICE USING SAMPLED INPUT DATA AND SEVERAL PREVIOUS OUTPUT DATA

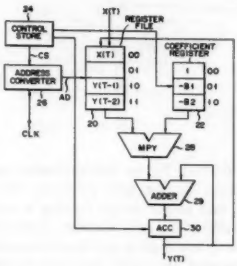
Susumu Matsuda, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 17, 1983, Ser. No. 467,347

Claims priority, application Japan, Feb. 23, 1982, 57-27810; Jul. 28, 1982, 57-131568

Int. Cl.⁴ G06F *15/31*

U.S. Cl. 364—724 **6 Claims**



1. An arithmetic processing device for calculating output data during each sampling period using the input data during the sampling period and the output data during a few preceding sampling periods, comprising:

register means having N addresses (where N is a positive integer) for storing the output data during a pluality of preceding sampling periods and the input data during the sampling period;

a control store for producing a first address signal CS of m bits (where N is≦2^m) corresponding to data to be read out;

address converting means, coupled to the control store and the register means, for converting the first address signal into a second address signal according to a current sampling period number T (=0, 1, 2, . . .), at least one bit of the second address signal AD being=(the corresponding at least one bit of CS - T modulo N) modulo N; and,

arithmetic processing means, coupled to the register means and to the control store, for reading the data from the register means with the second address signal and for performing predetermined operations for read out data.

4,561,066

CROSS PRODUCT CALCULATOR WITH NORMALIZED OUTPUT

Daniel R. Emmons, and William E. Swanson, both of San Diego, Calif., assignors to GTI Corporation, San Diego, Calif.

Filed Jun. 20, 1983, Ser. No. 505,902

Int. Cl.⁴ G06F *7/52*

U.S. Cl. 364—736 **16 Claims**

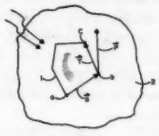
1. A cross product calculator for calculating the cross product of two vectors, where each of said vectors is defined by a pair of points and one of said points is common to both vectors, said cross product calculator comprising:

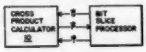
first register means to receive a coded representation of the coordinates of a first point of a first of said two vectors during a first interval of time,

second register means to receive a coded representation of the coordinates of the second point of said first vector during the first time interval, said second point being common to each of said two vectors,

a plurality of multiplier means connected to receive output signals from said first and second register means, which output signals are indicative of the contents of said first and second register means during the first time interval, said multiplier means computing the product of said output signals,

subtractor means connected to receive signals indicative of the products computed by said multiplier means, said subtractor means subtracting the products provided by certain ones of said multiplier means from the products





provided by certain other ones of said multiplier means, and

third register means connected to receive output signals from said subtractor means, which output signals are indicative of the differences computed by said subtractor means, said third register means storing therein a partial representation of the cross product of said two vectors.

4,561,067

MULTI-CHANNEL CROSS-TALK INTERFERENCE REDUCTION CIRCUIT USING MODULATION-MULTIPLYING-DEMODULATION CORRELATOR

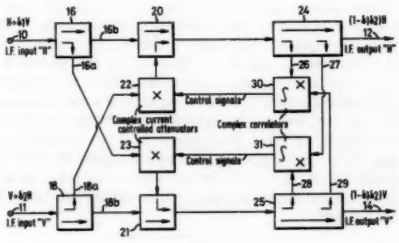
James H. A. McKeown, Ipswich, England, assignor to British Telecommunications, London, England

Filed Jun. 9, 1983, Ser. No. 502,755

Claims priority, application United Kingdom, Jun. 23, 1982, 8218166

Int. Cl.⁴ G06G *7/19*; H04B *15/00*

U.S. Cl. 364—819 **15 Claims**



1. A multi-channel circuit for reducing cross-talk interference between signals passing along plural channels, said multi-channel circuit comprising:

plural signal processing channels, each channel having (a) an input (**10, 11**), (b) a first signal splitter (**16, 18**) connected to said input and providing at least two replicas (**16*a*–16*b*, 18*a*–18*b*) of signals input thereto, (c) a signal combiner (**20, 21**) connected to combine one of the split replica signals from its own channel (**16*b*, 18*b***) with a feedback signal provided from a different channel, and (d) a second signal splitter (**24, 25**) connected to receive the combined

output of the signal combiner, to provide plural replicas (26–27, 28–29) of such combined signals and also to provide an output replica (12, 14) thereof;

each channel also including a signal correlator (30, 31) receiving a replica signal (26–29, 28–27) from the second signal splitter of each said processing channel and providing a control signal representing the degree of correlation therebetween;

each channel also including at least one controlled attenuator (22, 23) receiving a replica signal (18*a*, 16*a*) from the first signal splitter in a different channel and providing an attenuated version thereof as said feedback signal to its signal combiner, the degree of attenuation being determined by the control signal provided by the correlator in that same channel; and

wherein said correlator includes a signal multiplier feeding an integrator, each said multiplier having (a) a signal modulator, (b) a multiplier, and (c) a demodulator.

4,561,068

ARRANGEMENT FOR THE SUPPRESSION OF SIGNAL INTERFERENCE

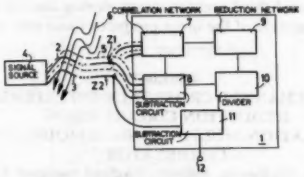
Ulrich Kindler, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,057

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224768

Int. Cl.⁴ G06G *7/00*

U.S. Cl. 364—825 **10 Claims**



6. A circuit for processing a useful signal (X) transmitted over first and second transmission networks arranged to have different sensitivities to interference signals and in a manner so as to suppress interference signals Z_1 and Z_2 produced in the first and second transmission networks, respectively, the processing circuit comprising: a subtraction circuit for subtracting the composite signals $X+Z_1$ and $X+Z_2$ received from the first and second transmission networks, respectively, to derive a difference quantity (Z_1-Z_2) which is the difference between the interference signals Z_1 and Z_2 on the first and second transmission networks, respectively, means responsive to said difference quantity and including at least a correlation network for deriving an electric quantity determined by the interference signal received from one of said transmission networks, and means for combining said electric quantity with the composite signal from said one transmission network so as to produce a useful output signal (X) substantially free of the interference signal.

4,561,069

MAGNETIC BUBBLE MEMORY DEVICE GATES

Yoshio Satoh; Takeyasu Yanase, both of Yokohama, and Kazunari Komenou, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 20, 1983, Ser. No. 505,978

Claims priority, application Japan, Jun. 23, 1982, 57-106666; Mar. 4, 1983, 58-034632

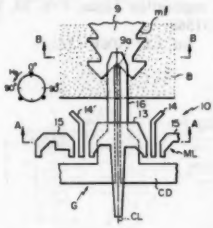
Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—36 **26 Claims**

1. A magnetic bubble memory device generating a magnetic drive field, comprising:

a magnetic layer in which magnetic bubbles can be propagated;

a major line, formed entirely by patterns of magnetically soft material on said magnetic layer, along which the magnetic bubbles propagate in response to the magnetic drive field rotating in the plane of said magnetic layer, said major line having gate portions defined by patterns of magnetically soft material formed on said magnetic layer;



minor loops, defined by an ion-implanted pattern in said magnetic layer, having gate portions, each of the gate portions of said minor loops having a cusp and corresponding to one of the gate portions of said major line; and

gates, operatively associating said major line with said minor loops, comprising conductor patterns extending between the gate portions of said major line and the corresponding gate portions of said minor loops.

4,561,070

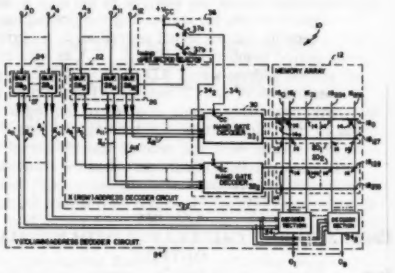
INTEGRATED CIRCUIT MEMORY

Bruce G. Armstrong, Belmont, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 1, 1983, Ser. No. 510,058

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—227 **2 Claims**



1. A memory circuit comprising:

(a) a matrix of memory elements;

(b) a decoder circuit responsive to an address signal for selectively addressing the memory elements in the matrix, said decoder circuit having a plurality of sections for selectively addressing the meory elements in different, corresponding sections of the matrix;

(c) a decoder section selector for electrically coupling one of the sections of the decoder to a power source while electrically decoupling the remaining sections of the decoder from said power source selectively in response to the address signal; and

(d) wherein the decoder circuit comprises a plurality of gates each one thereof having an input transistor coupled to the address signals and to the decoder section selector and an output transistor fed by the input transistor having an

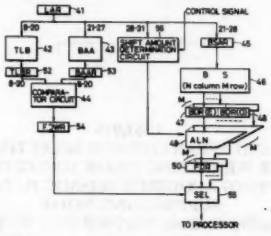
output electrode coupled to the matrix of memory elements and an additional electrode adapted for coupling to the power source independent of the decoder section selector.

4,561,071

STORAGE SYSTEM HAVING BUFFER STORAGE

Noriaki Hashimoto; Kanji Kubo, and Chikahiko Izumi, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1983, Ser. No. 519,699
Claims priority, application Japan, Aug. 9, 1982, 57-138099
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—230 **4 Claims**



1. A storage system having main storage means for storing data, and buffer storage means for retaining as a copy part of the data retained by said main storage means, and means for fetching data from said buffer storage means in response to a logical address, comprising register means for storing said logical address; means connected to said register means for translating said logical address set in said logical address register means into a real address; said buffer storage means including means connected to said register means for retaining data in blocks and for outputting data from M blocks ($M \geqq 2$) in response to receipt of said logical address from said logical address register means; M aligning means connected to said buffer storage means for aligning the data in each block output from said buffer storage means in accordance with said logical address; buffer address array means connected to said register means for retaining the addresses in said main storage means of the data stored in the blocks in said buffer storage means and for outputting M addresses in accordance with said logical address; selection signal generation means connected to said buffer address array means and said translating means for outputting a selection signal in accordance with the real address output from said address translating means and the addresses output from said buffer address array means; and means connected to said aligning means and said selection signal generation means for selecting one of outputs from said aligning means in accordance with said selection signal from said selection signal generation means.

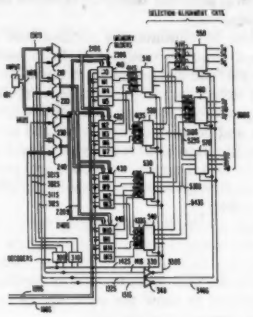
4,561,072

MEMORY SYSTEM HANDLING A PLURALITY OF BITS AS A UNIT TO BE PROCESSED

Takeshi Arakawa, and Hiroki Ikeda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 250,784, Apr. 3, 1981. This application Oct. 21, 1983, Ser. No. 528,389
Claims priority, application Japan, Apr. 4, 1980, 55-44302
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—230 **4 Claims**

1. A memory system, comprising; a plurality of memory blocks, each memory block storing a plurality of information units, means for receiving an address which designates one information unit stored in one of said memory blocks, a plurality of address producing means, each having an arithmetic function, means for supplying said address received at said address receiving means to each of said address producing means in common, means for generating a plurality of data to be added to or subtracted from said address, means for supplying said data to respective address producing means, each of said address producing means performing an arithmetic operation using said address and said supplied data to produce a new



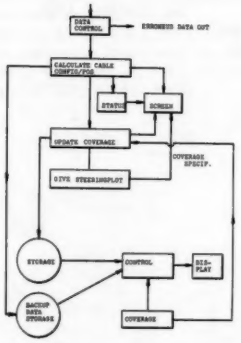
address, respectively, means for applying the new addresses produced by said plurality of address producing means to respective memory blocks, and means for simultaneously reading a plurality of information units designated by said new addresses out of said plurality of memory blocks.

4,561,073

SYSTEM FOR SORTING SEISMIC DATA IN MARINE SURVEYS

Helge Brands Aeter, Stabekk; Tor A. Ommundsen, Saetre, and Oyvind Mjoen, Blommenholm, all of Norway, assignors to Geophysical Company of Norway A.S., Hovik, Norway

Filed May 13, 1982, Ser. No. 378,015
Claims priority, application Norway, May 26, 1981, 811786
Int. Cl.⁴ G03H *3/00*; G01V *1/38*; G01S *9/66*
U.S. Cl. 367—19 **3 Claims**



1. In a system for measuring and collecting data from seismic surveys at sea with the aid of a vessel including at least one seismic signal transmitter operatively connected to the vessel to be towed thereby, at least one acoustic streamer cable operatively connected to the vessel to be towed thereby having means located along said cable for measuring reflection signals produced by said at least one transmitter, and position defining means at the locations of said reflection signal measuring means, the improvement comprising:

means to subdivide an area to be surveyed into a grid of individual rectangles of a defined size and geographical position;

said at least one streamer cable being divided along its length into a plurality of subgroups of said reflection signals measuring means and respective position defining means so that the subgroups provide seismic data of near-traces from the subgroup closest to the vessel, distant-traces from the subgroup farthest from the vessel and middle-traces from at least one subgroup between said nearest and farthest subgroup;

control means to continuously receive and sort independently and simultaneously data from said near-traces, middle-traces and distant-traces to obtain and transmit the measured reflection and position defining data therefrom;

a computing unit for receiving and processing said measured reflection and position defining data and transferring it to the respective individual rectangles of said grid and computing from said measured reflection and position defining data the configuration and position of the subgroups of the streamer cable;

display means to continuously during the surveying operation display control data, recording data and streamer cable position on a grid of individual rectangles corresponding to the rectangles formed by subdividing the area being surveyed to show the coverage of said data in the individual rectangles of the grid;

means to evaluate said displayed data operatively connected to the vesses's navigation system for use in navigating the vessel;

means to compare said measured reflection and position defining data with known data to determine the degree of coverage in the area being surveyed so that a single pass of the vessel over said area produces a substantially complete survey; and

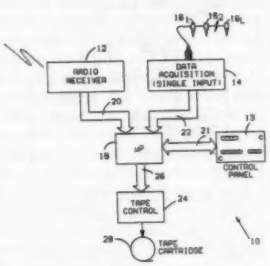
means to store said data.

4,561,074

COMPUTATIONALLY EFFICIENT WEIGHTING AND VERTICAL STACKING METHODS AND APPARATUS FOR IMPROVING THE SIGNAL-TO-NOISE RATIO OF SEISMIC DATA

Ralph E. Warmack, Kingwood, Tex., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 29, 1982, Ser. No. 454,401
Int. Cl.⁴ G01V *1/00*
U.S. Cl. 367—46 **20 Claims**



1. A method for processing incoming seismic-trace signals acquired during seismic prospecting utilizing plural initiations of a seismic source, comprising the steps of:

improving the signal to noise ratio in incoming seismic trace signals by selecting an exponent from a group of exponents including 0, 1, 2, 4 and 8, for use with a remotely deployed field recorder for inverse power weighting the incoming seismic trace signals based on the ratio of the expected level of seismic signals, which can include reflections, refractions or ground roll, and the expected level of ambient noise, which can include burst noise,

dividing each incoming seismic-trace signal into a series of component seismic-trace signals each within a time window of a predetermined length, each component seismic-trace signal comprised of samples of the incoming seismic-trace signal;

calculating a respective weighting value for each respective component seismic-trace signal based on the selected exponent by summing the samples of the respective component seismic-trace signal and next raising the sum to the selected exponent and then taking the inverse of the result;

applying the respective weighting values to the respective component seismic-trace signals; and

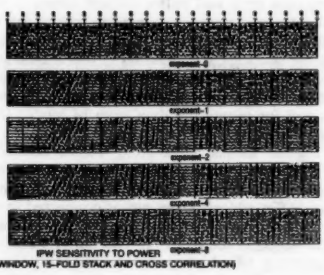
summing the corresponding weighted component seismic-trace signals from plural initiations of the seismic source for forming a composite seismic-trace signal.

4,561,075

METHOD AND APPARATUS FOR SELECTING INVERSE POWER WEIGHTING PRIOR TO VERTICALLY STACKING ACQUIRED SEISMIC DATA FOR SUPPRESSING NOISE

James W. Smith, Houston, Tex., and Jerry W. Ehlers, Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 29, 1982, Ser. No. 454,403
Int. Cl.⁴ G01V *1/00*
U.S. Cl. 367—46 **23 Claims**



1. A method for processing incoming seismic-trace signals acquired during seismic prospecting utilizing plural initiations of a seismic source, comprising the steps of:

improving the signal to noise ratio in incoming seismic trace signals by selecting an exponent from a group of exponents including 0, 1, 2, 4 and 8, for use with a remotely deployed field recorder for inverse power weighting the incoming seismic trace signals based on the ratio of the expected level of true earth response seismic signals, which can include reflections, refractions or ground roll, and the expected level of ambient noise, which can include burst noise;

dividing each incoming seismic-trace signal into a series of component seismic-trace signals each within a time window of a predetermined length, each component seismic-trace signal comprised of samples of the incoming seismic-trace signal;

calculating a respective weighting value for each respective component seismic-trace signal based on the selected exponent;

applying the respective weighting values to the respective component seismic-trace signals; and

summing the corresponding weighted component seismic-trace signals from plural initiations of the seismic source for forming a composite seismic-trace signal.

4,561,076
SONAR METHOD AND APPARATUS

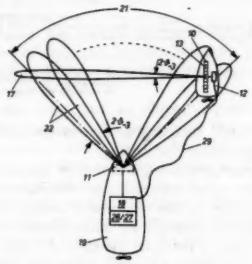
Herbert Gritsch, Achim, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 27, 1983, Ser. No. 498,778

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221013

Int. Cl.⁴ G01S *15/89*

U.S. Cl. 367—88 **26 Claims**



1. In a method for underwater ranging with the aid of sonic pulses, by irradiating a given transmitting area with sonic energy pulses from a transmitter mounted in a marine vessel, receiving sonic energy echoes reflected from bodies in the transmitting area in a manner which is selective with respect to direction in a plurality of receiving sectors arranged in a fan shape, and associating the received echoes with respective reflection centers within the respective receiving sectors on the basis of associated sonic pulse travel times, the improvement wherein: said step of receiving is carried out on a second marine vessel different from the vessel carrying the transmitter and which travels at the side and rear of from the vessel carrying the transmitter at such a distance therefrom that the receiving sectors cover at least part of the given transmitting area; the azimuthal width of the transmitting area is made very small; and said step of associating comprises determining the relative distance between the two vessels and the direction of the transmitting area, relative to the heading of the second vessel, at least at the moment of transmission of each sonic pulse, in order to associate the reflection centers with the echoes.

4,561,077
WRIST WATCH HAVING A BRACELET ATTACHED TO THE WATCH CASING BY A HINGE

Elmar Mock, Bienne, and Alphonse Bron, Bassecourt, both of Switzerland, assignors to ETA S.A., Fabriques d, E bauches, Grandes, Switzerland

Continuation of Ser. No. 498,822, May 27, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,986

Claims priority, application Switzerland, Jun. 11, 1982, 3620/82

Int. Cl.⁴ G04B *37/00*

U.S. Cl. 368—282 **9 Claims**

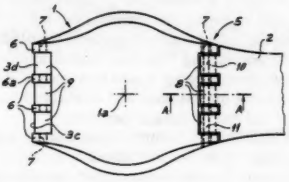
1. A wrist watch including:

a casing comprising a back, a glass and a peripheral casing portion which is made of a plastics material, having a side wall which is substantially orthogonal to said back;

two arrays of n first fixing elements projecting from said side wall and forming an integral part of said peripheral casing portion, the first elements of each array being disposed in a side-by-side relationship to form n−1 first spaces therebetween, each first element being provided with a hole therethrough, the holes of the n first elements of the same array being aligned along an axis parallel to said back;

wherein said peripheral casing portion includes two masking wall portions which project from said side wall, one masking wall portion being connected to the first elements of one of said arrays, the other masking wall portion being connected to the first elements of the other of said arrays, said masking wall portions being integral with said peripheral casing portion and being disposed between said first elements and said glass, each first space thus being partially defined by two adjacent first elements, by a portion of said side wall, and by a portion of the external surface of one of said masking wall portions, which faces towards said back;

two bracelet halves made of a plastics material, each having an internal surface, an external surface and an end for fixing to said casing;



n−1 second fixing elements projecting from said fixing end of each bracelet half to be engaged into said n−1 first spaces of a respective array, said n−1 second elements being disposed in a side-by-side relationship to form therebetween n−2 second spaces for receiving n−2 first elements of a given array, each second fixing element being provided with a hole, the holes of the n−1 second elements being aligned; and

two pivot axis members, each axis member being engaged in the holes of the first elements of one of said arrays and in the holes of the second elements which are fixed with respect to one of said bracelet halves.

4,561,078
DISC CHANGER AND DISC HOLDER AND BOX FOR USE WITH SUCH A CHANGER

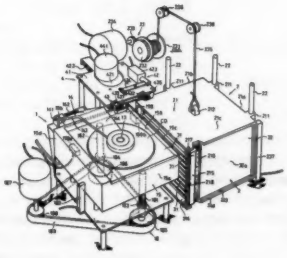
Mitsuhisa Nakayama, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,174

Claims priority, application Japan, Aug. 11, 1982, 57-140061; Aug. 18, 1982, 57-143638; Aug. 19, 1982, 57-144391; Aug. 20, 1982, 57-145166; Aug. 23, 1982, 57-146671

Int. Cl.⁴ G11B *17/00, 5/48*

U.S. Cl. 369—38 **15 Claims**



1. A disc changer comprising a player deck, provided with a turntable which is mounted for rotation in a chassis and a loading device for transferring a disc to and from the turntable, which loading device comprises:

a platform mounted for selective movement up and down relative to the turntable,

a plurality of disc holders, configured for selective sliding

movement onto and off of the platform, each disc holder having a circular recess, which is open at the top for receiving a disc, each disc holder having a hole in the bottom of the recess, each disc holder being movable to a position where the disc holder is supported by the platform after the disc holder is moved to the platform,

a box having a plurality of disc holder compartments, each compartment being dimensioned to receive a disc holder,

a transport mechanism for moving the respective disc holders in a substantially horizontal direction to a predetermined position on the platform,

a lift mechanism comprising a lift compartment for the box, said compartment and the box being movable up and down to one of a plurality of predetermined height positions, said transport mechanism moving a disc holder between the holder compartment and the platform, the lift compartment having first and second adjoining upright sides and a first opening in said first upright side, said first opening being dimensioned and configured for sliding the box into and out of the compartment,

the player deck further comprising an optical head disposed adjacent the turntable and which is movable relative to the turntable, for playing optically readable information discs,

the hole in each holder being formed so that the holder as it moves to a position below the top of the turntable can pass the optical head without impediment,

the loading device including a loading lever provided with a disc loader for urging a disc into the correct position on the turntable,

the transport mechanism including means for engagement with respective disc holders during the movement alongside the platform.

4,561,079

SUPPORT STRUCTURE OF AN OPTICAL PART

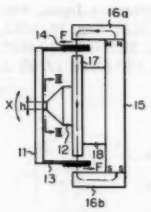
Ichiro Narumi, Tokorazawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,394

Claims priority, application Japan, Sep. 8, 1982, 57-136163[U]

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **7 Claims**



1. A support structure of an optical part placed in a path of a light beam of a system for optically reading out recorded information, said system having first and second servo control systems for respectively moving the light beam in a pair of directions which are perpendicular to each other, in which the optical part is incorporated in either of the first and second servo control systems, the support structure comprising:

an elastic member for supporting and permitting a movement of the optical part in a direction causing the movement of the light beam in one of said directions, the support structure being constructed so that a resonance frequency of a movement in a direction other than said direction of movement of the optical part can be controlled in a frequency range which is within a controllable frequency range of the other servo control system.

4,561,080

AUTOMATIC FOCUSING DEVICE IN AN OPTICAL TYPE DATA REPRODUCING APPARATUS

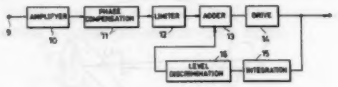
Shohei Yamazaki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 21, 1982, Ser. No. 451,889

Claims priority, application Japan, Dec. 24, 1981, 56-194363[U]

Int. Cl.⁴ G11B *7/00, 21/02*

U.S. Cl. 369—45 **7 Claims**



1. An automatic focusing device in an optical type data reproducing apparatus comprising:

a photodetector producing a detection signal corresponding to a relative distance between an objective lens and a disk;

servo controlling means responsive to the detection signal from said photodetector for automatically controlling the relative distance between the objective lens and the disk so that a focal point is formed on a signal plane of the disk to achieve correct focus, said servo controlling means having a converging state in which proper servo control is achieved and a divergent state in which said servo controlling means operates to cause relative movement between the objective lens and disk in a direction away from correct focus;

divergent state detection means for detecting when said servo controlling means has deviated from the converging state and entered the divergent state; and

compulsory pull-back means for forcibly moving, upon detection of the divergent state of said servo controlling means by said divergent state detection means, said objective lens at least to a position in which said servo controlling means can perform a normal servo control.

4,561,081

OPTO-ELECTRONIC APPARATUS FOR INSCRIBING AND/OR READING RECORDING TRACKS BY MEANS OF A RADIATION BEAM

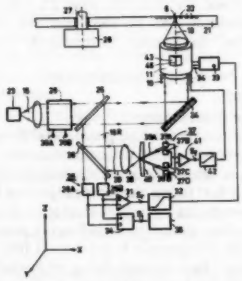
Peter J. M. Janssen, and Gerard E. van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,701

Claims priority, application Netherlands, Jul. 10, 1981, 8103305

Int. Cl.⁴ G11B *7/00, 21/10*

U.S. Cl. 369—45 **18 Claims**



1. An apparatus for inscribing and/or reading recording tracks in a recording surface of a record carrier with a radiation beam, which apparatus comprises:

a frame,

an objective holder provided with an objective having an optical axis and having a lens system for concentrating the radiation beam so as to form a radiation spot in a focussing plane,

a bearing arrangement for supporting the objective holder for movement relative to the frame in accordance with a desired number of degrees of freedom out of six theoretically possible, independent degrees of freedom, said bearing arrangement including means for counteracting those movements of the objective holder relative to the frame which are in accordance with the other, undesired degrees of freedom, and

actuator means for producing electromagnetic actuator forces for driving the objective holder relative to the frame in accordance with said desired degrees of freedom, characterized in that:

the apparatus comprises an objective-position measuring device for continuously measuring the position of the objective holder relative to the frame in accordance with at least one of said undesired degrees of freedom and generating a positional error signal,

said counteracting means comprises at least one levitation coil secured to one of said frame and objective holder and magnetic means arranged on the other of said frame and objective holder, said magnetic means, cooperating with said levitation coil via an air gap so as to produce an electromagnetic levitation force which counteracts undesired movement of the objective holder in accordance with at least one of said undesired degrees of freedom, and

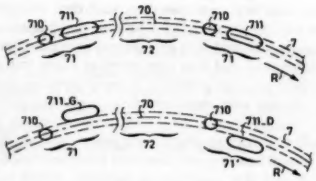
there is provided a levitation control circuit, which compares the positional error signal from the objective-position measuring device with a reference signal of specific value and which comprises at least one output for applying an electric levitation current whose value depends on the error signal to said levitation coil for maintaining the position of the objective relative to the frame in accordance with said undesired degree of freedom substantially constant.

4,561,082

PROCESS AND SYSTEM FOR OPTICAL RECORDING AND READING ON A MOBILE DATA CARRIER

Jean-Louis Gérard; Pierre Berthet; Claude Bricot, and Michel Audoin, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 13, 1983, Ser. No. 503,655
Claims priority, application France, Jun. 15, 1982, 82 10407
Int. Cl.⁴ G11B 7/00
U.S. Cl. 369—45 **11 Claims**



1. A process for controlling the vertical position of a scanning spot of a beam intended to be focussed in a reference plane of a mobile data carrier; the data being recorded along tracks arranged in a given configuration; the process being put into effect in an optical data transcription apparatus comprising at least one radiant energy source associated with a lens for focussing said beam and opto-electronic signal detection and processing means collecting radiation emerging from the portion of said reference surface illuminated by the scanning spot and converting the radiation into an electric signal representing the instantaneous deviation between the position of the focussing plane and the position of the reference plane; which process comprises the following steps:

provision along said tracks in a given spatial configuration of discrete sites formed of virgin areas free of any recording of said data whose surfaces define said reference plane and having dimensions greater than those of the scanning spot focussed in this reference plane,

generation of a signal defining a time window, in synchronism with the passage of said areas through the zone illuminated by the scanning spot,

measurement of the signal representing the instantaneous deviation between the position of the focussing plane and the reference plane during these time windows and storage of this measurement during the time interval separating two signals defining the time windows,

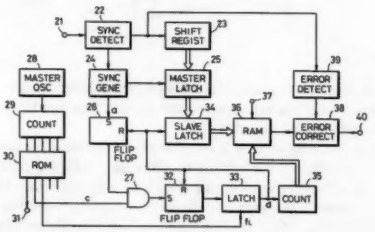
and generation of a focussing error signal by electric filtration of the values of said successively measured and stored deviations.

4,561,083

MEMORY CIRCUIT WRITE-IN SYSTEM

Kazunori Nishikawa, Machida; Yoshiki Iwasaki, Yokohama; Isao Masuda, Sagamihara; Shoji Ueno, Zama; Makoto Komura, Tokyo, and Nobuaki Takahashi, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 20, 1983, Ser. No. 496,589
Claims priority, application Japan, May 26, 1982, 57-89388
Int. Cl.⁴ H04N 5/76
U.S. Cl. 369—59 **4 Claims**



1. A memory circuit write-in system comprising:

terminal means for receiving a digital signal including a time base fluctuation component, one frame of said digital signal being constituted by at least a synchronizing signal and information data, said digital signal having a repetition frequency with a period of one frame of said digital signal;

a memory circuit for writing therein and reading out therefrom the received digital signal;

a first flip-flop which is set in response to the synchronizing signal within said received digital signal;

a master oscillator for producing a signal which includes no time base fluctuation;

a circuit for generating a write-in period discriminating signal, a latch pulse and a write enable signal from the output signal of said master oscillator, said write-in period discriminating signal being generated twice within one read-out frame period which is constant and substantially equal to said period of one frame, said latch pulse having a period which is less than ½ a minimum pulse interval of said write-in period discriminating signal;

a gate circuit responsive to an output signal of said first flip-flop and to said write-in period discriminating signal for passing said write-in period discriminating signal when said first flip-flop is in a set state; and

write-in control signal generating means responsive to said gate circuit for producing a write-in control signal in

response to the write-in period discriminating signal which occurs immediately after said synchronizing signal, said memory circuit being controlled by said write-in control signal so that a write-in address at which the digital signal is written is changed in response to said write-in control signal, and the digital signal is written into said memory circuit during a write-in period which exists twice within the constant read-out frame period in correspondence with said write-in period discriminating signal.

4,561,084

DISK LOADING AND UNLOADING SYSTEM

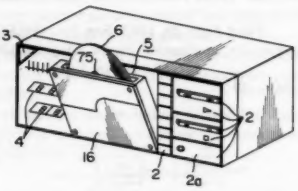
Mitsuo Satake, and Shigekata Toyota, both of Toyokawa, Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering, both of Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,154

Claims priority, application Japan, Jun. 4, 1982, 57-94968; Jun. 4, 1982, 57-94969

Int. Cl.⁴ G11B *17/04, 19/16*

U.S. Cl. 369—75.2 **11 Claims**



1. A disk loading and unloading system comprising:

a main body including a spindle section that can be fitted in a center opening of a disk;

a disk holding section formed with an opening for inserting and withdrawing said disk, said disk holding section having a clamper section disposed on a side of an inserted disk opposite from said spindle section and said clamper section being adapted to be fitted on said spindle section, said disk holding section being connected to said main body and pivotally movable between a first position in which said spindle section is fitted in the center opening of said disk and in said clamper section to hold the disk in place and a second position in which said spindle section is released from engagement with said clamper section and said disk to release the disk;

push-out means mounted in said disk holding section, said push-out means being operative to push at least a portion of the disk out of the disk holding section through the disk inserting and withdrawing opening when the disk holding section is moved from the first position to the second position; and

wherein said spindle section comprises a center spindle connected to a forward end of a main shaft of a main motor, and a disk guide fitted on said main shaft for axial sliding movement and resiliently urged to move toward said center spindle, said center spindle being formed at its outer periphery with a first inclined surface portion and said disk guide being formed at its outer periphery with a second inclined surface portion inclined outwardly for a greater length than said first inclined surface portion, and wherein said clamper section has a clamper allowing, when the disk holding section moves from the second position to the first position, the edge of the center opening of the disk to come into contact with the first inclined surface portion of the center spindle.

4,561,085

FRONT LOADING DISC PLAYER

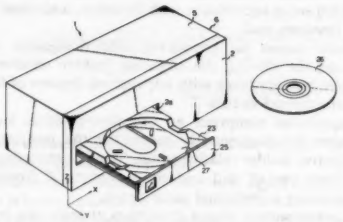
Tadashi Funabashi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,645

Claims priority, application Japan, Sep. 30, 1983, 58-152503[U]

Int. Cl.⁴ G11B *1/00, 3/08, 17/04*

U.S. Cl. 369—77.1 **15 Claims**



1. A front-loading disc player comprising:

a housing having an aperture formed in a substantially vertically oriented outer panel thereof;

playing means disposed within said housing for supporting and rotating a disc to read out the contents thereof;

a disc transport mechanism for transporting a disc to be played by said playing means, comprising a tray which is slidably mounted for movement directed inward and outward with respect to said housing along a substantially horizontal first predetermined direction, with at least a portion of said tray passing through said aperture, said tray having an aperture formed therein having a diameter greater than that of said disc, said disc transport mechanism further comprising a container mounted to permit only substantially vertically directed movement relative to said tray and having a portion thereof provided with a disc supporting surface being disposed at a lower part of said tray aperture, said container being provided with a plurality of engaging protrusions formed extending substantially horizontally therefrom, first and second cam members of elongated shape mutually disposed on opposite sides of said tray substantially parallel to said first predetermined position and slidably mounted on said tray for movement along said predetermined position, said cam members being respectively formed with a plurality of cam apertures of inclined shape formed therein, positioned to engage said engaging protrusions of said container such that said container is supported by said cam members, and further comprising an elongated rack gear portion formed along said first cam member, said disc transport mechanism further comprising a linking mechanism coupled to mutually link said first and second cam members such that movement of said first cam member along said first predetermined position produces a corresponding movement of said second cam member in the opposite direction, said tray being movable to a first predetermined position at which said tray aperture is disposed substantially entirely out of said housing and a second predetermined position at which said tray aperture is disposed within said housing with said disc aligned in a predetermined vertical relationship with respect to said playing means, said disc transport mechanism further comprising a rack drive gear wheel meshing with said rack gear portion of said first cam member, drive means coupled to said rack drive gear wheel, operable to rotate said rack drive gear wheel such as to drive said first cam member inward with respect to said housing along said first predetermined position, and locking means for locking said linking mechanism with respect to said tray while said disc transport mechanism is in any position other than said second predetermined position and for holding said linking mechanism in a freely

operable condition when said disc transport mechanism is at said second predetermined position thereof;

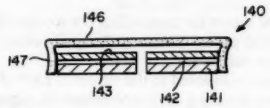
said drive means being thereby operable to drive said disc transport mechanism inward with respect to said housing from said first predetermined position to said second predetermined position with a disc mounted on said container supporting surface, acting through said rack drive gear wheel, said rack gear portion, and said first cam member fixedly coupled to said tray by said locked linking mechanism, and, when said second predetermined position is reached and said locked condition of said linking mechanism is released, acting to drive said first cam member further inward with respect to said housing, said linking mechanism thereby being moved from a non-operating position thereof in which said disc is supported by said container supporting surface to an operating position thereof in which said container is lowered to mount said disc on said playing means.

4,561,086

OPTICAL WRITE/READ UNIT WITH SELECTIVE-TRANSPARENCY COVER

Frederick F. Geyer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 12, 1983, Ser. No. 493,845
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—100 **2 Claims**



2. In an optical write/read unit of the type adapted for use with writing and reading light beams of a predetermined wavelength, said unit comprising (i) a support, (ii) a record layer overlying said support, said record layer being responsive to said writing light beam to produce marks thereon, said marks being detectable when said layer is scan illuminated by said reading light beam, and (iii) protective cover means overlying said record layer, the improvement wherein said cover means is highly transmissive to light of said predetermined wavelength and highly non-transmissive to a large proportion of light at wavelengths above and below said predetermined wavelength.

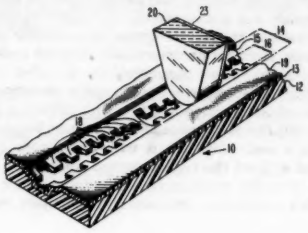
4,561,087

CONDUCTIVE VIDEO DISC

Leonard P. Fox, Cherry Hill; Pabitra Datta, Cranbury; Dennis L. Matthies, and Hirohisa Kawamoto, both of Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 818,279, Jul. 25, 1977, abandoned. This application Dec. 20, 1979, Ser. No. 105,550
Claims priority, application United Kingdom, Mar. 15, 1977, 10824/77
Int. Cl.⁴ G11B *11/08*
U.S. Cl. 369—276 **28 Claims**

1. A video information record, adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megaherz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a moldable plastic material containing a sufficient amount of finely divided conductive particles so that the material has a bulk resistivity below about 500 ohm-centimeters at 900 MHz and having a layer of dielectric material at the disc surface, said surface having a spiral groove therein, said groove dimensioned for reception therein of said playback stylus and containing an information track constituted by a surface relief pattern in said groove of such



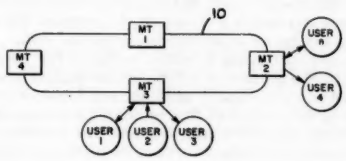
dimension to accommodate recovery of signals of said bandwidth upon establishment of said motion at said rate.

4,561,088

COMMUNICATION SYSTEM BYPASS ARCHITECTURE

Keith S. Champlin, Minneapolis, and Pradip C. Kar, Coon Rapids, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 13, 1984, Ser. No. 579,326
Int. Cl.⁴ H04J *1/16, 3/14, 3/02, 3/00*
U.S. Cl. 370—16 **51 Claims**



1. A loop-structured data communications bus serving a plurality of user data sources and sinks which are linked thereto, comprising

a plurality of multiplex terminals in communication with ones of the system user data sources and sinks,

at least three receivers in each of said terminals,

at least three transmitters in each of said terminals,

means within each of said terminals for controlling coupling of any one of said receivers in a terminal with any one of said transmitters in the same terminal,

first and second redundant transmission paths extending between each of said terminals and coupling first and second ones of said transmitters in one terminal with first and second ones of said receivers in one other terminal, whereby said plurality of terminals are serially connected in a closed loop, and

at least one bypass transmission path extending between a third one of said transmitters in one terminal and a third one of said receivers in non-adjacent ones of said serially connected terminals.

4,561,089

CORRELATION DETECTORS FOR USE IN DIRECT SEQUENCE SPREAD SPECTRUM SIGNAL RECEIVER

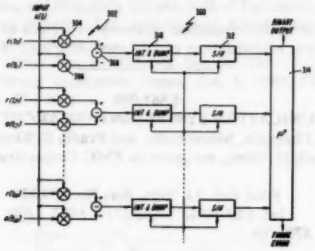
Donald W. Rouse, Lilburn, and Lawrence B. Horwitz, Alpharetta, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Mar. 23, 1984, Ser. No. 592,670
Int. Cl.⁴ G06J *1/00*; G06G *7/19*
U.S. Cl. 370—18 **7 Claims**

1. In a direct sequence spread spctrum code division multiplex system, including a plurality of transmitters synchronized

to a common timing signal and each transmitting a data signal s(t) spread by a bipolar pseudo-random code which is a different assigned shift of a common bipolar sequence;

a receiver synchronized to said timing signal for receiving said data signals and discriminating the signal transmitted by a predetermined transmitter spread by a bipolar pseudo-random code having a predetermined assigned code sequence shift from the signals transmitted by the other transmitter, said receiver including a plurality of correlation detectors and means for developing (1) a first reference bipolar sequence r(t) that is a replica of the common bipolar sequence and has a code shift that is within one code chip of the assigned shift of the predetermined transmitter and is displaced from the common bipolar code sequence applied to the other correlation detectors by a common fraction of a



code chip less than unity, and (2) a second reference bipolar sequence e(t) that is a replica of the common bipolar sequence and has an unassigned code sequence shift,

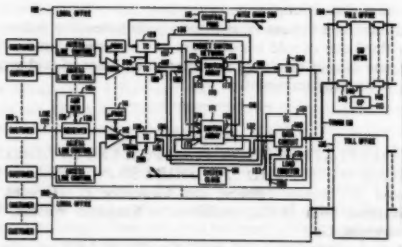
each of said correlation detectors including first means for obtaining the product of the transmitted sequences s(t) and the first reference bipolar sequence r(t); second means for obtaining the product of the transmitted sequences s(t) and the second reference bipolar sequence e(t) and third means for obtaining a difference between the products obtained by the first and second means; synchronous integrator means for integrating the difference; means for synchronously sampling an output of the integrator means and signal processor means responsive to outputs of said correlation detectors to synchronize said receiver to said predetermined transmitter.

4,561,090

INTEGRATED SELF-CHECKING PACKET SWITCH NODE

Jonathan S. Turner, Evanston, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 18, 1983, Ser. No. 495,716
Int. Cl.⁴ H04Q *11/04;* **H04J** *3/00, 6/00*
U.S. Cl. 370—60 **15 Claims**



1. An arrangement for checking a packet switch node, comprising

means for determining bit signals representing the difference between the number of packets received by said packet switch node and the number of packets transmitted by said packet switch node;

means responsive to said determined bit signals to check for excursions of said determined bit signals beyond predefined difference limits for indicating inoperative conditions in said node;

said determining means comprises counter means responsive to the receipt of one of said packets to increment said determined bit signals and further responsive to the transmission of another one of said packets for decrementing said determined bit signals;

said node further comprises a plurality of input terminals and a plurality of output terminals and said determining means further comprises a plurality of input packet monitor means each associated with one of said input terminals for generating a packet receive signal upon the receipt of said one of said packets and a plurality output packet monitor means each associated with one of said output terminals for generating a packet transmitted signal upon transmission of said other one of said packets for the determination of said determined bit signals;

said determining means further comprises means for sampling each of said packet monitor means to detect the generation of said receive packet signal and said transmitted packet signal to control the determination of said determined bit signals;

said sampling means comprises a plurality of storage means each associated with an individual one of said packet monitor means for storing said packet receive signal and said packet transmitted signal;

ring counter means for controlling the storage of said packet receive and packet transmitted signals into said plurality of storage means; and

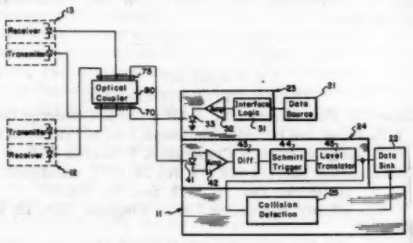
logical means connected to the output of each of said storage means for updating said determined bit signals upon the storage of said packet receive and packet transmitted signals in ones of said storage means.

4,561,091

DATA RECEIVER

Frederick W. Scholl, Riverdale, and Michael H. Coden, New York, both of N.Y., assignors to Codenoll Technology Corporation, Yonkers, N.Y.

Filed Sep. 23, 1983, Ser. No. 534,987
Int. Cl.⁴ H04J *3/02, 3/00, 6/00*
U.S. Cl. 370—85 **12 Claims**



1. A data communications system comprising:

a communicating medium;

a plurality of transceivers, each transceiver including transmitting means for transmitting data onto said medium and receiving means for receiving data communicated on said medium by another transceiver; and

collision detecting means to which is applied a received data signal from said receiving means, said detecting means comprising:

timing means for producing a timing signal commencing with the leading edge of the received data signal of a

first polarity and continuing for a period of time equal to the longest interval during which the received data signal is expected to be of said first polarity, and

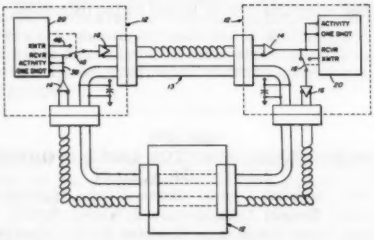
means for comparing the timing signal with the received data signal from said receiving means and for producing a collision signal when the polarity of said received data signal remains the same for longer than said longest interval.

4,561,092

METHOD AND APPARATUS FOR DATA COMMUNICATIONS OVER LOCAL AREA AND SMALL AREA NETWORKS

Michael O. Shaver, Killeen, Tex., assignor to The BDM Corporation, McLean, Va.

Filed May 13, 1983, Ser. No. 494,540
Int. Cl.[4] H04J *6/00*
U.S. Cl. 370—89 **12 Claims**



1. In a data communications network having a transmission data channel with a plurality of network nodes connected thereto according to a loop topology, connection apparatus at each network node comprising:

a transceiver means having

an upstream receiver means for receiving message data on an upstream side of said data channel at said network node, and

a downstream transmitting means for applying message data to the downstream side of said data channel at said network node,

switching means operable

in a pass through state for effectively connecting said upstream receiving means and said downstream transmitting means for applying the message data received on said upstream side of said data channel to the downstream side of said data channel, and

in a source transmit state for connecting a local source of message data to said downstream transmitting means for applying local message data to said downstream side of said data channel, and

means for controlling the operating state of said switching means, said controlling means comprising

means responsive to received message data when said switching means is in said pass through state for maintaining said switching means in said pass through state,

means responsive to said local source for actuating said switching means from said pass through state to said local source transmit state when no message data is being received from said upstream side of said channel at the time of actuation, and

means for comparing upstream received message data with said transmitted message data when said switching means is in said transmit state, and for terminating local transmission and thereafter actuating said switching means to said pass through state, if the received data is not identical to the transmitted data,

wherein said controlling means further comprises

means responsive to said comparing and terminating means for repeatedly applying to said downstream channel a unique bad message marker, and

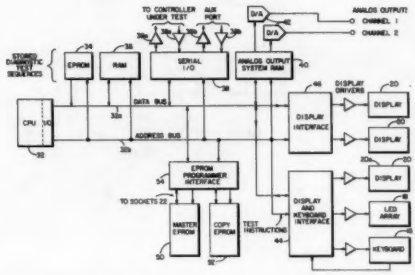
said comparing and terminated means terminating local transmission after receipt of said bad message marker by said node.

4,561,093

SERVICING A SOFTWARE-CONTROLLED ELEVATOR

John C. Doane, and David L. Hardenbrook, both of Glastonbury, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Feb. 22, 1983, Ser. No. 468,438
Int. Cl.[4] G06F *11/00*; G01R *31/00*
U.S. Cl. 371—20 **5 Claims**



1. For diagnostically testing a system controller by a computer, a diagnostic device connectable to the system computer is characterized by a diagnostic computer for providing stored, sequenced diagnostic test instructions to the system computer in response to a coded diagnostic test signal, identifying a particular diagnostic test to be performed, for receiving system operating information from the system computer for processing the information in a predetermined manner of the stored diagnostic test and for providing information signals indicating the results of the sequenced test;

a code entry keyboard means for providing the coded diagnostic test signal;

display means including at least one numerical display and a plurality of lights, for providing visual indications of test results in response to display signals provided in response to the information signals provided by the diagnostic computer;

display device means for converting the information signal into drive signals that operate the displays;

a diagnostic test sequence overlay comprising a removable sheet which fits around the keyboard and the displays and contains a cutout for the keyboard and each numerical display and each light, coded test instructions that can be entered into the keyboard for performing a diagnostic test, coded identifiers for each numerical display and each light to correlate a diagnostic test result indicated on the diagnostic test carried out by a code entered on the keyboard.

4,561,094

INTERFACE CHECKING APPARATUS

Stefan P. Jackowski, Endicott, and James T. Moyer, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

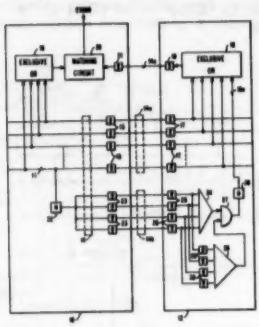
Filed Jun. 29, 1983, Ser. No. 508,772
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—24 **3 Claims**

1. An apparatus for locating an abnormal circuit condition in a group of interface lines interconnecting a first circuit module to a second circuit module, said group of interface lines being connected to a first group of lines disposed within said first

circuit module and to a second group of lines disposed within said second circuit module, comprising:

first gate means disposed within said first circuit module and connected to said first group of lines for generating an output signal when a signal exists on a predetermined number of said first group of lines prior to transmission across said group of interface lines;

second gate means disposed within said second circuit module and connected to said second group of lines for generating an output signal when a signal exists on said predetermined number of said second group of lines subsequent to transmission across said group of interface lines; and



circuit means connected to the first and second gate means for comparing the output signal from said first gate means, representative of the signal existing on said first group of lines prior to transmission across said group of interface lines, and the output signal from said second gate means, representative of the signal existing on said second group of lines subsequent to transmission across said group of interface lines, and for generating an error signal indicative of the existence of said abnormal circuit condition in at least one line of said group of interface lines when similar output signals are not received from said first and second gate means.

4,561,095

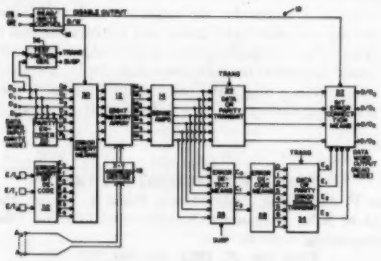
HIGH-SPEED ERROR CORRECTING RANDOM ACCESS MEMORY SYSTEM

Aurangzeb K. Khan, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Jul. 19, 1982, Ser. No. 399,670

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—38 **23 Claims**



1. An error correcting random access memory system comprising: memory array means for storing data, said memory array means including a plurality of addressable memory words, each memory word having a predetermined equal number of memory cells; means for storing a data word input to said memory in a selected one of said memory words, said data word having a preselected number of bits of data, each bit of said data word being retained in a corresponding memory cell of said selected memory word, said preselected number of bits being less than the number of memory cells in said memory word; means for generating from said data word a parity word having a preselected plurality of parity bits, the state of each said parity bit being the function of the state of a different combination of said data word bits; means for storing said parity word in the remaining memory cells of said selected memory word; and means for outputting said data word from said memory, including: (i) means for detecting the present state of the memory cells of said selected memory word containing said data word; (ii) means for detecting the present state of the memory cells of said selected memory word containing said parity word; (iii) means for generating a check word from said data word bits and said parity word bits such that said check word state indicates if any single data word bit has switched to an erroneous state, said means including means for identifying which specific data bit is erroneous; and (iv) means responsive to said check word state for correcting any said identified erroneous data bit in said output data word.

4,561,096

BURIED SEMICONDUCTOR LASER AVOIDING THYRISTOR ACTION

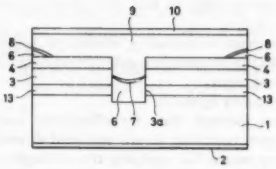
Hirofumi Namizaki; Ryoichi Hirano; Hideyo Higuchi; Etsuji Oomura; Yasushi Sakakibara, and Wataru Susaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,261

Claims priority, application Japan, Jun. 21, 1982, 57-108201

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—46 **6 Claims**



1. A semiconductor laser device, comprising:

a semiconductor substrate of a first conductivity type;

a first semiconductor layer of a second conductivity type formed on said seminconductor substrate;

an active layer of said first or second conductivity type formed in contact with parts of sides of said first semiconductor layer, said active layer having a relatively narrow band gap;

resonant cavity means bounding said active region;

a second semiconductor layer of said first conductivity type formed on said first semiconductor layer;

a third semiconductor layer formed at least on said active layer in contact with parts of said sides of said first semiconductor layer and sides of said second semiconductor layer,

electrode means connected to said substrate and said third semiconductor layer, and

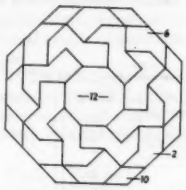
a fourth semiconductor layer of said first conductivity type and being lower in carrier concentration than said first semiconductor layer by at least a factor of five and formed between said semiconductor substrate and said first semiconductor layer.

4,561,097

PUZZLE FORMED OF GEOMETRIC PIECES HAVING AN EVEN NUMBER OF EQUILATERAL SIDES

Florence Siegel, 187-10 Aberdeen Rd., Jamaica Estates, N.Y. 11432

Filed Oct. 9, 1984, Ser. No. 658,571
Int. Cl.[4] A63F 9/10
U.S. Cl. 273—157 R 13 Claims



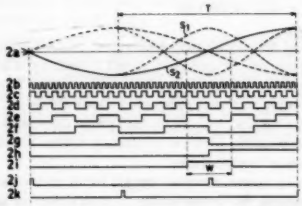
1. A puzzle comprising a plurality of pieces adapted to be juxtaposed to form a regular octagon, said pieces being formed by subdividing a number of blocks having the shape of a regular octagon to form a group of parts, which group includes a number of irregular octagons, said pieces comprising a number of said groups.

4,561,098

RECEIVER FOR FFSK MODULATED DATA SIGNALS

Nicolaas van Tol, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,779
Claims priority, application Netherlands, Sep. 29, 1981, 8104441
Int. Cl.[4] H04B 1/16; H03D 3/00
U.S. Cl. 375—49 3 Claims



2. A receiver for continuous FFSK modulated data signals having a maximum amplitude at the boundary between two adjacent data bits, wherein a first logic value is represented by a high frequency signal and a second logic value is represented by a low frequency signal having a frequency nominally equal to a predetermined fraction of said high frequency, the frequency of said low frequency signal being subject to deviation from a nominal value thereof due to certain sequences of the logic values of said signals, comprising clock signal regenerator means for detecting zero crossings of said data signals, generating zero crossing signals in response to each of said zero crossings, and generating clock signals synchronized to said zero crossing signals;

phase selector means connected to said clock signal regenerator means for receiving said zero crossing signals and adapted to select therefrom only zero crossing signals of said low frequency signal which occur within a time interval window corresponding to a maximum acceptable deviation of the frequency of said low frequency signal from the nominal value thereof, such selected zero crossing signals constituting synchronizing signals having transitions occurring essentially undelayed with respect to zero crossings of said low frequency signal;

means for applying said synchronizing signals to said clock signal regenerator means to synchronize said clock signals;

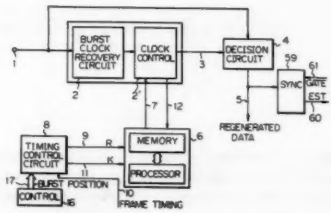
and demodulator means connected to said clock signal regenerator means, for receiving said modulated data signals and demodulating the so received signals under control of said clock signals.

4,561,099

CLOCK RECOVERY SYSTEM FOR TDMA SATELLITE COMMUNICATION SYSTEM

Takeo Atsugi; Shuuichi Samejima, and Tatsurou Masamura, all of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Dec. 2, 1983, Ser. No. 557,675
Claims priority, application Japan, Dec. 2, 1982, 57-210599; Nov. 18, 1983, 58-215939
Int. Cl.[4] H04L 27/06, 7/00
U.S. Cl. 375—97 6 Claims



1. A clock signal recovery system for TDMA satellite communication system in which a transmitting earth station transmits periodically modulated burst signals which are synchronized with each other in both frequency and phase and a receiving earth station demodulates that burst signal by using the recovered clock signal comprising:

an input terminal for receiving TDMA bust signals;

a burst clock recovery means to obtain burst clock from the received burst signal;

a clock control means to generate the recovered clock by controlling a local clock oscillator according to stored frequency and/or phase information and said burst clock,

a frequency and/or phase memory means for storing frequency and/or phase information of an output of said clock control means for more than two frame periods,

said frequency and/or phase memory means including a processor means for providing a signal of the average of the frequencies and/or phase information stored in memory,

a decision circuit for regenerating received burst signal by using the recovered clock signal,

a first output terminal coupled with output of said decision circuit to provide regenerated burst signal,

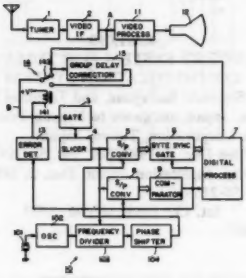
a synchronization detection circuit coupled with said output terminal for indicating establishment of clock synchronization of a clock signal after receiving predetermined pluality of bursts from the same transmitting earth station,

a second output terminal coupled with output of said synchronization detection circuit.

4,561,100
DIGITAL SIGNAL RECEIVER

Motoaki Asao, Daito, and Hideaki Nanko, Nishinomiya, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 340,656, Jan. 19, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,244
Claims priority, application Japan, Jan. 20, 1981, 56-7448; Jan. 21, 1981, 56-8276
Int. Cl.[4] H03D 1/04
U.S. Cl. 375—99 6 Claims



1. A digital signal receiver for receiving a transmitted digital signal including a data signal including a bit serial type of data and a reference clock signal and a specified code signal preceding said data signal, comprising:

(a) demodulating means for receiving and demodulating said digital signal being transmitted;

(b) slicer means for slicing at a predetermined level the digital signal demodulated by said demodulating means;

(c) sampling clock signal generating means for generating a sampling clock signal which is produced in synchronization with said reference clock signal included in an output signal from said slicer means;

(d) serial/parallel converting means for sampling said output signal from said slicer means with said sampling clock signal for reproducing said data signal and said specified code signal, and converting the bit serial type of data in said data signal to a bit parallel type of data;

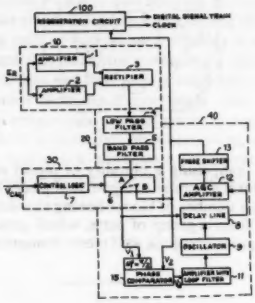
(e) detecting means for detecting an error in at least one of the specified code or the bit parallel type of data in an output from said serial/parallel converting means, so that non-coincidence of a bit phase is detected between said sampling clock signal and the data signal included in said slicer output signal caused due to a group delay characteristics of a transmission path including a path from transmitter to said demodulating stage;

(f) group delay characteristic correcting means disposed within a transmission path between said demodulating means and said slicer means for the purpose of correction of non-coincidence of said bit phase, said correcting means being responsive to the error detection output from said error detecting means for flattening the total group delay characteristic of the transmission path, including the correcting means, from a transmitter to an input terminal of said slicer means.

4,561,101
CLOCK-FREQUENCY RECOVERY DEVICE ADAPTED TO HIGH-FREQUENCY RADIOCOMMUNICATIONS IN DISTURBED MEDIA

Hervé Pinsard; Claude Collin, and Joël Faydit, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Jul. 15, 1983, Ser. No. 514,248
Claims priority, application France, Jul. 23, 1982, 82 12904
Int. Cl.[4] H04L 7/00; H03D 3/24
U.S. Cl. 375—108 4 Claims



1. Apparatus for recovering a clock signal of a received signal to produce a recovered clock signal, comprising:

rectifying means for receiving said signal, rectifying it and producing a rectified signal having a component at a clock frequency of said received signal;

means, coupled to said rectifying means, for filtering the rectified signal, said filtering means having a narrow passband;

output means for outputting said recovered clock signal, said output means including:

an input;

an output supplying said recovered clock signal;

phase comparator means, coupled to said input and to said output, for comparing phases of a signal available on said input and said recovered clock signal;

oscillator means, coupled to said phase comparator means, for generating a clock frequency signal in response to the phase comparison;

time-delay means, coupled to said input and to said oscillator means, for introducing a time delay to said clock frequency signal, said time delay being equal to a whole number of periods of said clock signal;

amplifier means, coupled to said time-delay means, for providing a constant level signal; and

phase shift means, coupled to said output and to said amplifier means, for shifting a phase of said constant level signal and providing said recovered clock signal; and

switching means, coupled to said filter means and said input and said output, for providing the filtered rectified signal to said input when said received signal is of good transmission quality and coupling said input to said output when said received signal is of poor transmission quality.

4,561,102
PITCH DETECTOR FOR SPEECH ANALYSIS

Dimitrios P. Prezas, Chicago, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 20, 1982, Ser. No. 420,234
Int. Cl.[4] G10L 1/00
U.S. Cl. 381—49 9 Claims

1. A pitch detector for human speech operating on equal-length frames of a speech pattern comprising:

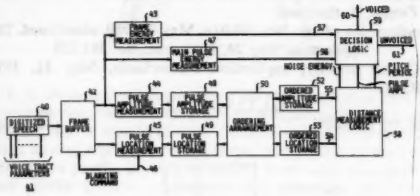
means responsive to the speech pattern for forming a resid-

ual wave by substantially removing the formant effects of the vocal tract,

means responsive to the residual wave of each successive frame for storing signals representative of the amplitudes and locations of a predetermined number of evenly spaced samples of instantaneous amplitudes of said residual waves of said speech frame, each frame corresponding to the lowest expected fundamental speech frequency,

means responsive to said stored residual sample amplitude and location representative signals of the speech frame for locating the residual sample of maximum amplitude within said speech frame,

means responsive to the speech frame stored amplitude and location representative signals for selecting and storing a set of residual samples of said speech frame including said maximum amplitude residual sample and residual samples



within a predetermined amplitude range of the maximum amplitude residual sample spaced not less than a minimum number of residual samples from the residual sample of maximum amplitude and from each other within said speech frame, said minimum spacing corresponding to the highest expected fundamental speech frequency,

means responsive to the location signals of the selected residual samples of the speech frame for detecting a subset of selected residual samples including said residual sample of maximum amplitude having substantially equal spacings between them, and

means responsive to the location representative signals of said subset residual samples of the speech frame for generating a signal representative of the quotient of the spacing between extreme subset residual samples within said speech frame and one less than the number of subset residual samples therein to determine the pitch period.

4,561,103

PRINT INSPECTING METHOD AND APPARATUS

Satoru Horiguchi, Saitama, and Hiroshi Harima, Yokosuka, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00285, § 371 Date Mar. 22, 1983, § 102(e) Date Mar. 22, 1983, PCT Pub. No. WO83/00557, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 23, 1982, Ser. No. 483,956

Claims priority, application Japan, Jul. 29, 1981, 56-118893; Sep. 18, 1981, 56-146355; Nov. 11, 1981, 56-179599; Apr. 17, 1982, 57-63221

Int. Cl.⁴ G06K *9/00, 5/00*

U.S. Cl. 382—1 **7 Claims**

1. A method of inspecting prints comprising the steps of:

writing reference data from a reference print in a reference data memory;

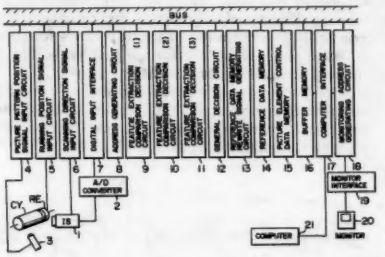
comparing image data obtained from a running print under inspection with said reference data for every printing element; and

determining whether or not said print is acceptable through said comparison of two data;

characterized by:

loading print running speed data while loading said reference data;

comparing said print running speed data loaded during loading said reference data with print speed data loaded during said image data obtained from a print under inspection; and



rewriting said reference data when the difference between said two speed data exceeds a predetermined value.

4,561,104

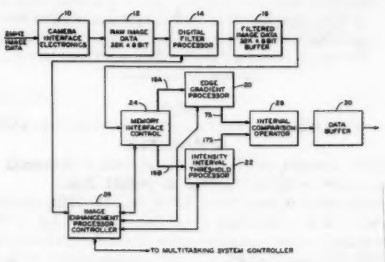
AUTOMATED INSPECTION OF HOT STEEL SLABS

Ronald J. Martin, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 16, 1984, Ser. No. 571,220

Int. Cl.⁴ G06K *9/56*

U.S. Cl. 382—8 **7 Claims**



1. A method for the real time enhancement of an image to provide for detection and classification of characteristic type surface imperfections occurring on the surface of a material of interest, comprising the steps of; forming a single digital image of said surface having digital values, processing said digital image to simultaneously perform, on the fly and in parallel, edge enhancement and intensity interval extraction of said digital image to respectively form edge and intensity enhanced intervals; and simultaneously comparing said edge and intensity enhanced intervals to generate image enhanced intervals which correspond to the joint existence of edge intervals and intensity intervals.

4,561,105

COMPLEX PATTERN RECOGNITION METHOD AND SYSTEM

Hewitt D. Crane, Portola Valley, and John S. Ostrem, Palo Alto, both of Calif., assignors to Communication Intelligence Corporation, Menlo Park, Calif.

Filed Jan. 19, 1983, Ser. No. 459,282

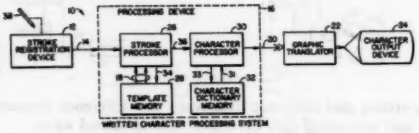
Int. Cl.⁴ G06K *9/78*

U.S. Cl. 382—13 **42 Claims**

1. A method for identifying patterns by means of a pattern registration means and a data processing means, wherein each pattern comprises at least one stroke based upon relative movement between a pattern-forming means and a pattern-accommodating means of said registration means, said registration means being operative to generate first signal information

represented by first signals specifying relative position sequentially along a stroke, said data processing means being provided with prestored second signal information represented by second signals and being operative to generate third signals representing third signal information, said third signal information comprising specification of identity labels for strokes for use in developing coded information specifying said pattern, said method comprising for at least one stroke:

designating from said first signal information a set of sequential first data points, said set of first data points being selected from or interpolated on the basis of said first signal information along said stroke;



defining templates consisting of said second signal information, each said template comprising a set of second data points defining relative sequentially related position values and a set of permissible tolerance values, each of said tolerance values representing a preselected deviation for its associated second data point, at least one of said permissible tolerance values differing from at least one other of said permissible tolerance values for a single template; and

comparing said first data points with said second data points to determine which of said templates provides best correspondence between said first and second signal information to produce said third signal information.

4,561,106

CHARACTER RECOGNITION PROCESS AND APPARATUS

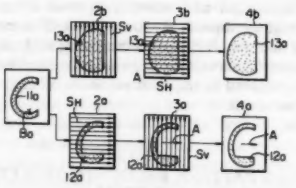
Masumi Yoshida, and Takeshi Masui, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 303,593, Sep. 18, 1981, abandoned, which is a continuation of Ser. No. 165,335, Jul. 2, 1980, abandoned, which is a continuation of Ser. No. 917,541, Jun. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 727,513, Sep. 28, 1976, abandoned. This application May 7, 1985, Ser. No. 731,612

Claims priority, application Japan, Sep. 29, 1975, 50-117365

Int. Cl.[4] G06K *9/54, 9/60*

U.S. Cl. 382—49 **2 Claims**



1. A character processor for a character recognition system which extracts white mesh information points surrounded by black mesh information points of character pattern information and which recognizes characters by determining directions in which said white mesh information opens, said character processor comprising:

means for receiving character pattern information including black and white mesh points corresponding to horizontal scanning lines of a character and black and white mesh points corresponding to vertical scanning lines of a character; and

conversion means for converting all white mesh points present between two black mesh points to black mesh points including:

vertical conversion means for converting all white mesh points of a vertical scanning line between two black mesh points of the vertical scanning line to black mesh points; and

horizontal conversion means for converting all white mesh points of a horizontal scanning line between two black mesh points of the horizontal scanning line to black mesh points.

4,561,107

WEB OF PLASTIC BAGS

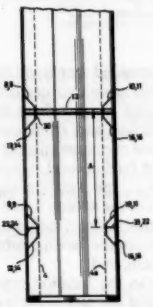
Kornelis Herder, Goor, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 148,016, May 8, 1980, abandoned. This application May 24, 1982, Ser. No. 381,228

Claims priority, application Netherlands, May 11, 1979, 7903733

Int. Cl.[4] B65D *27/10*

U.S. Cl. 383—37 **6 Claims**



1. A web of a plurality of interconnected valve free plastic bags (27) with gusset folds formed from a tubular foil, at least comprising a central (4, 4*a*) and two outer longitudinal gusset fold edges (2, 3, 2*a*, 3*a*) which bound a first and a second gusset fold part, each bag (27) of said web being open at one end opposite a transverse bottom seal (12) and further comprising:

(a) two first fold part seals (8, 9; 10, 11) at both sides of the web foil, which first fold part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6, 5) said first fold part seals extending between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) in the region of said transverse bottom seal (12) and diverging from said bottom seal (12) to the outer fold edges (2, 2*a*; 3, 3*a*),

(b) second fold part seals (13, 14; 15, 16) at both sides of the web foil which second foil part seals always connect an outer foil layer (1*a*, 1*b*) with an opposite gusset fold part (6*a*, 5*a*; 6, 5) said second fold part seals extending between the central (4, 4*a*) and outer longitudinal fold edges (2, 3; 2*a*, 3*a*) at the end of the bag remote from the transverse seal of this bag, said second fold part seals converging from the outer longitudinal fold edges (2, 3; 2*a*, 3*a*) to the transverse seal (12) of a subsequent bag (27) characterized in that at both sides of a bag an additional seal (30) extends substantially parallel to the fold edges and in the region between inner and outer fold edges, said additional seals (30) being connected with the second fold part seals (13, 14; 15, 16) and extending from said second fold part seals towards the transverse bottom seal (12) of a subsequent bag (27).

4,561,108

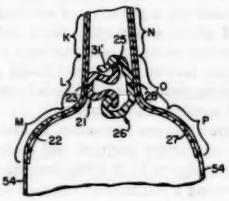
INTERLOCKING CLOSURE BAG FOR USE IN HIGH TEMPERATURE ENVIRONMENT

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1983, Ser. No. 567,242

Int. Cl.⁴ B65D *33/24*

U.S. Cl. 383—63 **24 Claims**



1. A container comprising two sidewalls and a closure fastening device, said fastening device comprising a first closure element and a second closure element; said first closure element having a general omega shape, comprising an apex portion and a profile portion extending from said apex portion, said profile portion comprising two inwardly curved arm portions terminating in two outwardly facing hook portions; said second closure element comprising an apex portion and a profile portion extending from said apex portion, said profile portion comprising outwardly curved first and second arm portions, wherein said first arm portion terminates in an inwardly curved hook portion adapted to engage in a hinging contact with one arm portion of said first closure element, said second arm portion of said second closure element first curving inwardly and then terminating in an outwardly curved portion adapted to engage in a clamping contact with one arm portion of said first closure element.

4,561,109

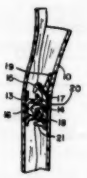
PLASTIC BAGS WITH RELEASABLE CLOSURE WHICH RESISTS OPENING FROM INSIDE

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 433,588, Oct. 12, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 623,623

Int. Cl.⁴ B65D *33/24*; B29C *24/00*

U.S. Cl. 383—65 **8 Claims**



1. A flexible bag, comprising:

first and second sheets joined at the bottom and sides thereof, and releasably joined near the top thereof to form a closable bag opening;

releasably closing means extending from near the tops of said first and second sheets and across said bag opening, comprising:

first releasing means extending from said first sheet toward said second sheet and comprising first and second downwardly-opening, hook-like locking protrusions integrally connected to a first common base attached to said first sheet;

second releasing means extending from said second sheet toward said first sheet and comprising third and fourth upwardly-opening, hook-like locking protrusions integrally connected to a second common base attached to said second sheet for releasably engaging with said first and second hook-like locking protrusions respectively;

said first and second releasing means being positioned so that said third protrusion extends between said first and second protrusions and said second protrusion extends between said third and fourth protrusions;

said first releasing means further comprising a fin extending towards the top of said first sheet from said first common base and being integrally connected with said first common base and attached to said first sheet, said fin causing the first protrusion of said first releasing means to pivot away from engaging with the third protrusion of said second releasing means to facilitate opening of the bag from outside thereof, said second releasing means having no portion thereof which overlies said first protrusion and which is contactable by said first protrusion as it pivots away from said third protrusion, and a weak point in said first common base located between said first and second protrusions defining a pivot point to further facilitate pivoting of said first protrusion away from said third protrusion upon the application of disengaging force from the outside of the bag.

4,561,110

BAG FOR THE STORAGE OF LIQUIDS

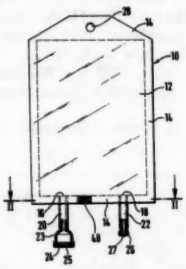
Reinhold Herbert, Neu-Anspach, Fed. Rep. of Germany, assignor to Fresenius AG, Neu-Anspach, Fed. Rep. of Germany

Filed Jan. 5, 1983, Ser. No. 455,868

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1982, 3200263

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 383—128 **20 Claims**



1. A polyolefin film storage bag for storing liquids, having at least one opening of hose-like structure welded thereto, said at least one structure comprising a cross linked copolymer of 60–95% by weight of olefin and 5–40% by weight of vinyl acetate wherein the olefin of the polyolefin film storage bag and the olefin of the copolymer are selected from the group consisting of ethylene, propylene, n-butylene, isobutylene, 4-methylpentene-1, chlorosulfonated ethylene, styrene, vinyl fluoride, vinylidene fluoride, and vinylidene chloride.

4,561,111

METHOD OF PREDISTORTING A SINGLE SIDEBAND SYSTEM

William A. Conner, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 6, 1984, Ser. No. 638,093

Int. Cl.⁴ H04B *15/00, 17/00*

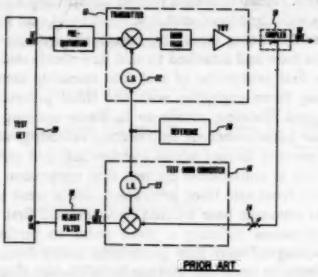
U.S. Cl. 455—63 **2 Claims**

1. A method of aligning a single sideband transmission system having a receiver and having a transmitter responsive to a predistortion circuit, comprising:

applying as an input to said predistortion circuit selected multiple test tones having the capability of producing intermodulation distortion,

applying a radio frequency output of said transmitter to the input of said receiver at power levels at least as high as those experienced in a practical radio transmission environment,

filtering selected ones of said test tones present in an intermediate frequency output of said receiver to remove the intermodulation distortion producing capability thereof,



PRIOR ART

monitoring the intermodulation distortion present in the filtered intermediate frequency output of said receiver, and

adjusting said predistortion circuit to minimize the monitored intermodulation distortion,

whereby the system, including both the transmitter and receiver is appropriately predistorted.

4,561,112

BROADCAST RECEIVER WITH AUTOMATIC BROADCAST STATION STORAGE

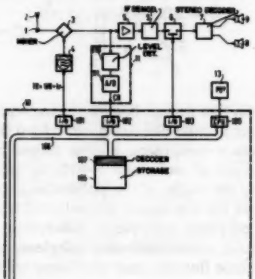
Wouterus Ridder, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,056

Claims priority, application Netherlands, May 4, 1983, 8301567

Int. Cl.⁴ H03J *7/18*; H04B *1/16*

U.S. Cl. 455—166 **3 Claims**



1. In a broadcast receiver having an input for receiving aerial signals transmitted from broadcast stations, means for generating oscillator signals having frequencies depending on tuning values applied thereto, mixing circuit means connected to said input and said oscillator signal generating means for generating mixing circuit output signals in response to said aerial signals and said oscillator signals, each of said mixing circuit output signals having a receiving level value associated with a corresponding tuning value, apparatus for selecting N receivable broadcast stations within a given wavelength range, comprising

preselection memory means user-connectable to said oscillator signal generator means, said preselection memory means having addressable memory locations for storing N preselection tuning values, each tuning in one of said N receivable broadcast stations;

means for furnishing a plurality of auxiliary tuning values within said given wavelength range and applying said auxiliary tuning values to said oscillator signal generating means, so that said mixing circuit means generates a plurality of mixing circuit output signals each associated with one of said auxiliary tuning values;

conversion circuit means connected to said mixing circuit means for converting each of said so-furnished mixing circuit output signals to a corresponding test level value thereby creating a plurality of test level values each associated with a corresponding tuning value;

means for furnishing a plurality of decreasing reference values starting with a maximum reference value; and

means connected to said reference value furnishing means and said conversion circuit means for comparing said plurality of test level values first to said maximum reference value and subsequently to progressively lower ones of said reference values until N so-compared test level values exceed the reference value compared thereto, and storing the auxiliary tuning values associated with said N test level values in said addressable memory locations to constitute said preselection tuning values.

4,561,113

DISTORTION CANCELLER FOR FM RECEIVER

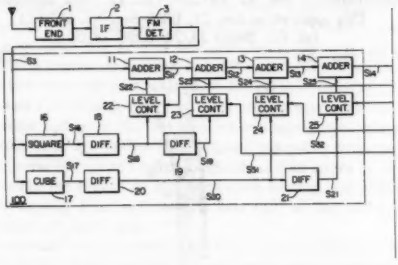
Michinori Naito, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,524

Claims priority, application Japan, Apr. 9, 1983, 58-61540; Jun. 3, 1983, 58-84025[U]

Int. Cl.⁴ H04B *1/10, 1/16*

U.S. Cl. 455—205 **5 Claims**



1. A distortion canceller for an FM receiver comprising:

first means for producing the n-th power of a demodulated FM signal, where n is a number greater than one;

second means for differentiating the produced n-th power of the demodulated FM signal to derive an n-th order distortion signal from the demodulated FM signal;

third means for adjusting the amplitude level of the derived n-th order distortion signal; and

fourth means for combining the demodulated FM signal with the level-adjusted n-th order distortion signal,

the level adjustment of the third means being set so that the n-th order distortion component of the demodulated signal and the derived n-th order distortion signal are cancelled by said fourth means.

4,561,114
COCHANNEL INTERFERENCE MEASUREMENT SYSTEM

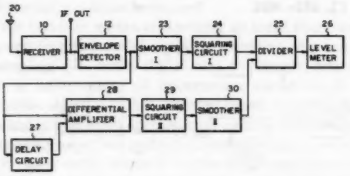
Shigeru Kozono, Kanagawa, and Keiichi Ishikawa, Nigata, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Oct. 14, 1983, Ser. No. 541,842

Claims priority, application Japan, Feb. 8, 1983, 58-18102; Apr. 20, 1983, 58-68428

Int. Cl.⁴ H04B *17/00*

U.S. Cl. 455—226 **6 Claims**



1. A cochannel interference measurement system for use in radio communications using angular modulation and coupled to a radio receiver, said system comprising:

a linear envelope detection means coupled to said radio receiver for detecting both a first desired signal and a second undesired signal through linear envelope detection;

low frequency spectrum component detection means coupled to said envelope detection means for detecting a low frequency spectrum component having a spectrum component frequency approximate in value to that of a fading frequency f_m of said desired or undesired signal, wherein $f_m = V$(velocity of a medium in which said radio receiver is located)/ ω(wavelength of said desired or undesired communication signal), and said low frequency component being related to the sum of said first signal and said second signal;

high frequency spectrum component detection means coupled to said envelope detection means for detecting a high frequency spectrum component of a frequency higher than said fading frequency, said high frequency component being related to the product of said first signal and said second signal;

means for providing a ratio of said low frequency spectrum component to said high frequency spectrum component; and

means coupled to said ratio providing means for indicating an amount of interference ratio of said first signal to said second signal in accordance with said ratio of said low frequency spectrum component to said high frequency spectrum component.

4,561,115
DECODER FOR TRAFFIC INFORMATION REGIONAL TONE SIGNALS

Heinrich Pfeifer, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,559

Int. Cl.⁴ H04B *1/16*

U.S. Cl. 455—228 **12 Claims**

1. A circuit for use in a radio receiver for decoding traffic information regional tone signals amplitude modulated with a broadcast signal carrier which has been demodulated, said circuit comprising:

a mixer receiving the demodulated broadcast signal and coupled to a local oscillator having a frequency higher than the frequency of the highest one of said regional tone signals;

an analog-to-digital converter coupled to the output of said mixer;

a digital band-pass filter coupled to the output of said analog-to-digital converter and having a mid frequency equal to the difference between that of said carrier and that of said local oscillator;

a digital clamping circuit having an input coupled to the output of said digital band-pass filter, serving to clamp positive and negative valued signals to positive and negative maximum values which are respectively determined by the number of digits of said input signals;

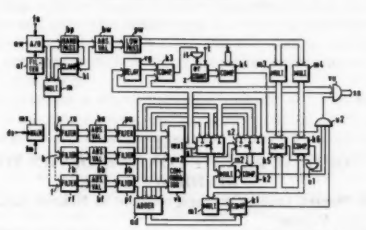
a multiplier having a first-input coupled to the output of said analog-to-digital converter, a second input coupled to the output of said digital clamping circuit;

a plurality of signal paths each having an input coupled to the output of said multiplier, each of said signal paths being associated with one of said regional tone signals and each comprising a digital resonance filter, followed by a digital absolute value former and a digital low pass filter having an upper cutoff frequency less than twice the lowest frequency of said regional tone signals;

a multiple comparator having a plurality of inputs and first and second maximum outputs;

each said low pass filter having first output coupled to one of said multiple comparator inputs;

first and second electronic multiple switches each having control inputs respectively connected to said multiple comparator first and second maximum outputs, each having a plurality of inputs, each said digital low pass filter having an output coupled to one of said plurality of inputs of said first multiple switch and to one of said plurality of inputs of said second multiple switch, and each having an output, said first electronic multiple switch being responsive to said first maximum output such that the one of said plurality of inputs having a first maximum value is coupled to said first electronic multiple switch output;



said second electronic multiple switch being responsive to said second maximum value output such that the one of said plurality of inputs having a second maximum value is coupled to said second electronic multiple switch output;

a multiple adder having a plurality of inputs each coupled to the output of one of said digital low pass filters and an output;

a first comparator having a first input coupled to said multiple adder output, a second input and an output;

a first constant multiplier coupling said first electronic multiple switch output to said first comparator second input;

a second comparator having a first input coupled to said second electronic multiple switch output, a second input, and an output;

a second constant multiplier coupling said first electronic multiple switch output to said second comparator second input;

a third comparator having a first input coupled to said first maximum output, a second input and an output;

a delay element coupling said first maximum output to said third comparator second input;

a counter having a count input for receiving clock signals, count outputs and a reset input;

circuit means coupling said third comparator output to said reset input;

a fourth comparator having a first input coupled to said

counter outputs, a second input receiving a constant serving as a threshold value, and an output;

a digital absolute-value former coupled to the output of said digital band pass filter;

a second digital low pass filter coupled to the output of said absolute value former, having a predetermined upper cutoff frequency;

third and fourth constant multipliers each coupled to said second digital low pass filter and each having an output;

a fifth comparator having a first input coupled to said third constant multiplier output, a second input coupled to said first multiple switch output and having an output;

a sixth comparator having a first input coupled to said fourth constant multiplier output, a second input coupled to said first multiple switch output and having an output;

first logic means coupled to said first second, fourth, fifth and sixth comparators for generating gating signals; and

second logic means having inputs coupled to said first maximum output, a gate input receiving said gating signals, and an output, said second logic means coupling said first maximum output to said second logic means output in response to said gating signals to provide a regional tone signal output.

4,561,116

OPTICAL REMOTE-CONTROL DEVICE FOR A RESIDENCE DOOR

Guy Neyret, Oullins, France, assignor to Neiman S.A., Courbevoie, France

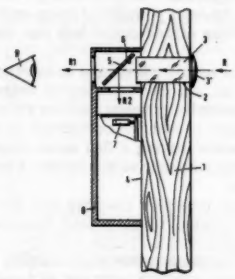
PCT No. PCT/EP83/00082, § 371 Date Nov. 22, 1983, § 102(e) Date Nov. 22, 1983, PCT Pub. No. WO83/03442, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 22, 1983, Ser. No. 568,203

Claims priority, application France, Mar. 24, 1982, 82 05141

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—603 **3 Claims**



1. An optical remote-control device for a residence door, which comprises an inspection glass in the door, a semi-transparent mirror which is arranged inclined behind the inspection glass and having a semi-reflecting side facing the inspection glass, and an optical receiver for generating a remote control signal which is located in the axis of reflection of the mirror.

4,561,117

FIBER OPTIC DIGITAL DATA TRANSMITTING SYSTEM

Loughrey R. Kuhn, Washington, D.C., assignor to Optical Communications Corporation, Silver Spring, Md.

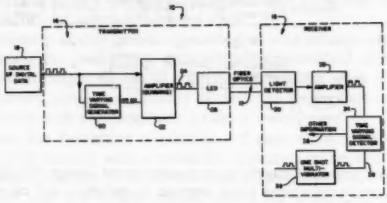
PCT No. PCT/US83/01934, § 371 Date Dec. 9, 1983, § 102(e) Date Dec. 9, 1983, PCT Pub. No. WO85/02732, PCT Pub. Date Jun. 20, 1985

Continuation of Ser. No. 288,111, Jul. 29, 1981, Pat. No. 4,420,842. This PCT application Dec. 9, 1983, Ser. No. 595,510

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—608 **36 Claims**



1. A transmitter for use in a digital data transmitting system having a transmitter, an optical transmission medium and a receiver comprising:

(a) means for producing a time varying signal which is time coincident with the non-zero amplitude levels of a digital signal having zero and non-zero amplitudes, the time varying signal being used to encode the occurrence of the non-zero digital amplitudes of the digital signal and other information;

(b) means for combining two input signals into a time coincident composite output signal, the first input signal being from a source of a digital signal which is to be transmitted, and the second input signal being from the means for producing the time varying signal; and

(c) means coupled to the means for combining for producing an optical signal varying in amplitude in accordance with the composite signal.

4,561,118

BUS SYSTEM WITH OPTICAL WAVEGUIDES HAVING COLLISION DETECTION

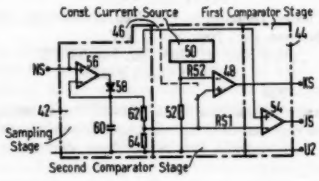
Hans Thinschmidt, Germering, and Rudolf Mittelmann, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 9, 1983, Ser. No. 493,038

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224425

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—608 **17 Claims**



1. A bus system, comprising:

an optical waveguide system;

a plurality of electro-optical transmitter means each for converting a digital electrical information signal to be

transmitted into light signal and for coupling it into the optical waveguide system;

a plurality of opto-electrical receiver means each without gain control and each having DC coupling through its entire signal receiving path for converting the light signal transmitted over the optical waveguide system into an electrical useful signal from which the information signal is recreated;

each of the transmitter means providing the light signal with a variable power level in selected steps so that power levels of the light signals on the waveguide system from all transmitter means functioning on the system can be set to substantially a same level; and

each of the receiver means comprising an input stage means for generating the useful signal, a sampling stage means for sampling the useful signal and creating a reference which is independent of information variations in the information signal which is adjusted based on useful signal levels and provides an approximate central referencing of the useful signal, a first comparator stage means connected to receive the useful signal from the input stage means and said reference for generating the information signal from the useful signal, a second comparator stage means having means for creating a selectable reference voltage amplitude variable in selected steps, the second comparator stage means comparing said sampling stage reference to the selected reference voltage so that a collision signal is only emitted when at least two transmitters simultaneously request access to the bus system, and wherein said means for creating a selectable reference voltage permits adjustment of the second comparator means reference voltage based upon system optical power levels and individual receiver means characteristics.

4,561,119

OPTICAL FREQUENCY MODULATION SYSTEM

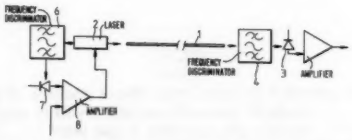
Richard E. Epworth, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,690

Claims priority, application United Kingdom, Sep. 3, 1981, 8126694

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—609 **12 Claims**



1. An optical communication system including at a transmitter a semiconductor injection laser, at a receiver a photodetector, and intermediate the transmitter and the receiver optical frequency discrimination means, the transmitter also including a source of bias current for the laser, whereby the laser is operated at a substantially constant average power level above the lasing threshold, and bias current modulation means arranged to modulate the bias current within predetermined limits, said limits being determined such that the depth of intensity modulation at the output of the frequency discrimination means is greater than the depth of intensity modulation at the input to the frequency discrimination means wherein an optical output is obtained from the front of the laser, supplying optical power for the receiver, the system further including means for deriving a second optical output from the laser, a second optical frequency discrimination means to which said second output is fed, the output of the second discrimination means being fed to a second photodetector which supplies one input to a differential amplifier the other input of which is fed with a modulation signal, the output of the differential amplifier being the modulated bias current for the laser.

4,561,120

PROTECTIVE RELAYING SYSTEM

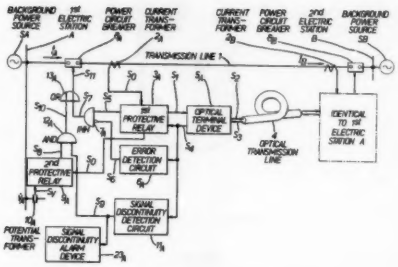
Fumio Andow, Hachioji, and Junichi Inagaki, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 1, 1984, Ser. No. 585,202

Claims priority, application Japan, Mar. 4, 1983, 58-35525

Int. Cl.⁴ H02H 3/28

U.S. Cl. 455—612 **9 Claims**



1. A protective relaying system for a transmission line between a first and a second electric station, said first electric station having a power circuit breaker connected in said transmission line and means for detecting a first electric quantity of said transmission line, said second electric station having means for detecting a second electric quantity of said transmission line, comprising:

optical transmission means provided between said first and second electric stations, including first optical terminal means provided at said first electric station for producing a first electrical signal, second optical terminal means provided at said second electric station connected to receive a second electrical signal corresponding to said second electrical quantity for converting said second electrical signal into an optical signal, and an optical transmission line connected between said first and second optical terminal means and connected to receive said optical signal from said second optical terminal means for transmitting said optical signal to said first optical terminal means, said first optical terminal means being connected to receive said optical signal from said optical transmission line for converting said optical signal into said first electrical signal;

first protective relaying means connected to receive said first electric quantity and said first electrical signal for detecting a failure in said transmission line based on said first electric quantity and said first electrical signal to produce a first relay output signal;

second protective relaying means connected to receive said first electric quantity for detecting said failure in said transmission line based on said first electric quantity to produce a second relay output signal;

error detection means connected to receive said first electrical signal for detecting an abnormality in said first electrical signal to produce a relay lock signal;

signal discontinuity detection means connected to receive said first electrical signal for detecting a discontinuity status in said first electrical signal to produce an enabling signal;

first logic circuit means connected to receive said first relay output signal and said relay lock signal for producing a first trip command when said first relay output signal indicates that said failure is detected and said relay lock signal indicates that said abnormality is not detected; and

second logic circuit means connected to receive said second

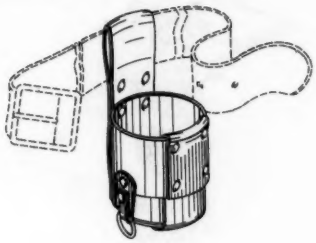
relay output signal and said enabling signal for producing a second trip command when said second relay output signal indicates that said failure is detected and said enabling signal indicates that said discontinuity status is detected;

said first and second trip commands being adapted to be connected to said power circuit breaker to trip said power circuit breaker.

281,828
WOMEN'S PANTS OR THE LIKE
Paulette Callaghan, 8400 B, Wedd, P.O. Box 13046, Shawnee Mission, Kans. 66212
Filed Sep. 19, 1983, Ser. No. 533,732
Term of patent 14 years
U.S. Cl. D2—28

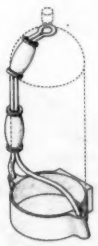
281,829
SHOE
Alfred D. Radford, Combe near Langport, Somerset, England, assignor to Clarks Limited, Somerset, England
Filed Sep. 6, 1983, Ser. No. 529,836
Claims priority, application United Kingdom, Jun. 8, 1983, 1013448
Term of patent 14 years
U.S. Cl. D2—309

281,830
BELT-SUPPORTED CANISTER HOLSTER
Robert W. Hengesbach, 7886 Mentor Rd., Mentor, Ohio 44060
Filed Aug. 17, 1983, Ser. No. 521,180
Term of patent 14 years
U.S. Cl. D2—400



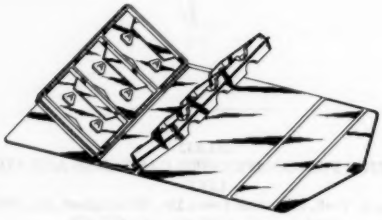
281,831
YARN HOLDER
Jill White, 629 S. Citrus Ave., Los Angeles, Calif. 90036
Continuation of Ser. No. 504,917, Jun. 16, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,410
Term of patent 14 years
U.S. Cl. D3—23

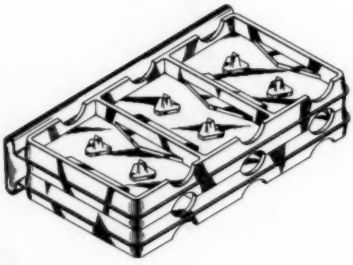
281,832
CARRIER FOR COMPRESSED GAS TANKS AND THE LIKE
Douglas E. Trull, 624 Annie Laura Dr., Birmingham, Ala. 35215
Filed Aug. 15, 1983, Ser. No. 522,970
Term of patent 14 years
U.S. Cl. D3—30.1



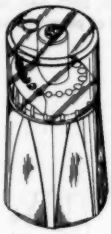
281,833
BABY SLING AND HARNESS FOR INFANTS WITH GASTRO-ESOPHAGEAL REFLUX
Jody E. Carney, 14 Fairfield St., Lowell, Mass. 01851
Filed Aug. 29, 1983, Ser. No. 527,415
Term of patent 14 years
U.S. Cl. D3—31

281,834
AUDIO CASSETTE STORAGE ALBUM
Robert D. Rose, Jr., Englewood, and Kenneth J. Phillips, Castle Rock, both of Colo., assignors to Communications Packaging Corporation, Denver, Colo.
Filed Jun. 1, 1983, Ser. No. 500,032
Term of patent 14 years
U.S. Cl. D3—35

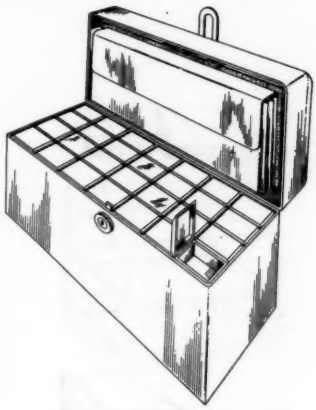


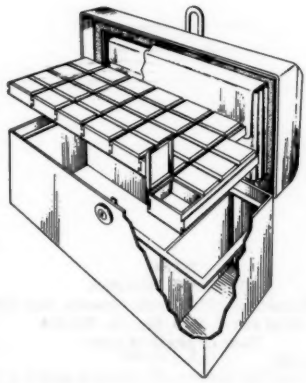


281,835
DRILL BIT ORGANIZER
Christopher A. Ali, 2855 Locke Dr., Beavercreek, Ohio 45385
Filed Jun. 17, 1983, Ser. No. 505,188
Term of patent 14 years
U.S. Cl. D3—74

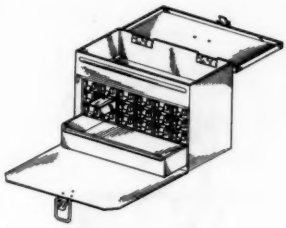


281,836
MEDICAL CASE
Patricia K. Sparkman, 5 Uxbridge Rd., Scarsdale, N.Y. 10583
Filed Jun. 23, 1982, Ser. No. 391,363
Term of patent 14 years
U.S. Cl. D3—74

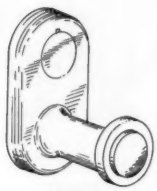




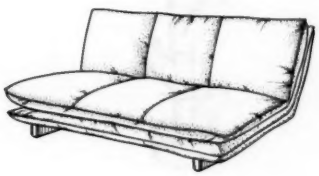
281,837
TOOL BOX
Chuen K. Lin, 141-1 Ho Ping Rd., Lu Chou Hsiang, Taipei Hsien, Taiwan
Filed May 17, 1983, Ser. No. 495,259
Term of patent 14 years
U.S. Cl. D3—74



281,838
HOOK
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Continuation of Ser. No. 446,858, Dec. 3, 1982, abandoned. This application Dec. 6, 1984, Ser. No. 678,382
Claims priority, application Australia, Oct. 12, 1982, 1821/82
Term of patent 14 years
U.S. Cl. D6—323



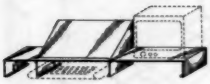
281,839
SOFA BED OR SIMILAR ARTICLE
Hans Hopfer, Paris, France, assignor to Alex Synn AG, Cham, Switzerland
Filed Jun. 28, 1983, Ser. No. 508,537
Claims priority, application Hague, Dec. 29, 1982, DM/002 093
Term of patent 14 years
U.S. Cl. D6—335



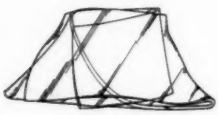
281,840
CHAIR
Richard K. Ogg, Westminster, Md., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed Mar. 9, 1983, Ser. No. 473,726
Term of patent 14 years
U.S. Cl. D6—366

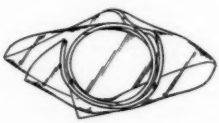
281,841
PLANTER
Carl R. Smith, Waco, Tex., assignor to Weststar Marketing, Inc., Waco, Tex.
Filed Dec. 19, 1983, Ser. No. 562,451
Term of patent 14 years
U.S. Cl. D6—404

281,842
COMBINED BOOK AND COMPUTER ACCESSORIES SUPPORT UNIT
Dale Blocklinger, 1600 - 18th Ave., Rock Island, Ill. 61201
Filed Sep. 12, 1983, Ser. No. 531,239
Term of patent 14 years
U.S. Cl. D6—419



281,843
EYEGLASS HOLDER
Gertrude L. Barnstone, 1401 Harold, Houston, Tex. 77006
Filed Jun. 6, 1983, Ser. No. 501,514
Term of patent 14 years
U.S. Cl. D6—449

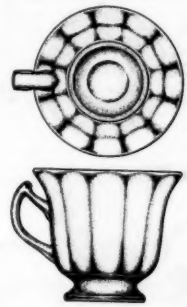




281,844
COUNTERTOP SHOWCASE
William D. Waldeck, 801 18th St., Parkersburg, W. Va. 26101
Filed Dec. 15, 1982, Ser. No. 432,696
Term of patent 14 years
U.S. Cl. D6—472

281,845
TOWEL RACK
Harold A. Smith, Emmaus, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed May 6, 1983, Ser. No. 492,449
Term of patent 14 years
U.S. Cl. D6—522

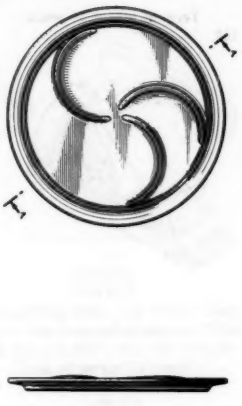
281,846
CUP
Walter Everhan, Klettenberg, Fed. Rep. of Germany, assignor to American Commercial Incorporated, Secaucus, N.J.
Filed May 26, 1983, Ser. No. 498,539
Term of patent 14 years
U.S. Cl. D7—9



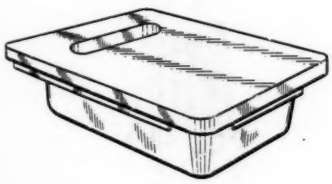
281,847
CUP
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jul. 27, 1983, Ser. No. 517,858
Term of patent 14 years
U.S. Cl. D7—9

281,848
CUP
Toschio Murai, Tajimi, Japan, assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Jul. 28, 1983, Ser. No. 518,208
Term of patent 14 years
U.S. Cl. D7—9

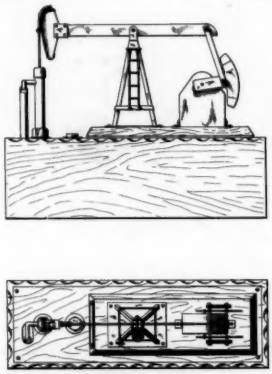
281,849
DIET PLATE
Alicia Cantor, 1646 Lorain Rd., San Marino, Calif. 91108
Filed Jun. 16, 1983, Ser. No. 504,830
Term of patent 14 years
U.S. Cl. D7—27



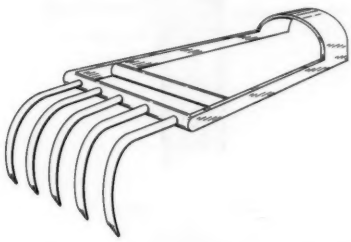
281,850
COMBINED DRAWER AND CHOPPING BOARD THEREFOR
Andre R. Morin, Dollard des Ormeaux, Canada, assignor to Namaar Enterprises Inc., Bolton, Canada
Filed Apr. 29, 1983, Ser. No. 490,222
Term of patent 14 years
U.S. Cl. D7—46



281,851
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Wayne E. Pack, Rapid City, S. Dak., assignor to Pack & Gibbs, Inc., Rapid City, S. Dak.
Filed May 3, 1983, Ser. No. 491,852
Term of patent 14 years
U.S. Cl. D7—301



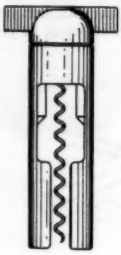
281,852
CLAM DIGGING TOOL
Bobby M. Poole, Rte. 2, Box 229, Asheboro, N.C. 27203
Filed Dec. 12, 1983, Ser. No. 560,211
Term of patent 14 years
U.S. Cl. D8—13



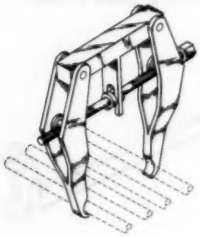
281,853
TIGHT SPOT WRENCH
Dale G. Basgall, 1634 Peltola, Ceres, Calif. 95307
Filed Mar. 7, 1983, Ser. No. 472,557
Term of patent 14 years
U.S. Cl. D8—23

281,854
FORCE SELECTOR AND READOUT UNIT FOR TORQUE TOOLS
Bosko Grabovac, Arcadia, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.
Filed Dec. 13, 1982, Ser. No. 449,474
Term of patent 14 years
U.S. Cl. D8—24

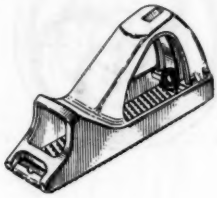
281,855
CORKSCREW
Jacques Kuhn, Rikon, Switzerland, assignor to Heinrich Kuhn Metallwarenfabrik AG, Rikon, Switzerland
Filed Dec. 12, 1983, Ser. No. 560,853
Term of patent 14 years
U.S. Cl. D8—42



281,856
CONVEYOR CHAIN TOOL
George Hamatani, Rte. 1, Box 400, Clarksburg, Calif. 95612
Filed Sep. 6, 1983, Ser. No. 529,252
Term of patent 14 years
U.S. Cl. D8—72

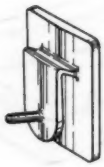


281,857
PLANING TOOL
Michael H. Groves, Warwick, England, assignor to The Stanley Works Limited, Sheffield, England
Filed Jul. 8, 1983, Ser. No. 512,409
Claims priority, application United Kingdom, Jan. 14, 1983, 1010823
Term of patent 14 years
U.S. Cl. D8—101

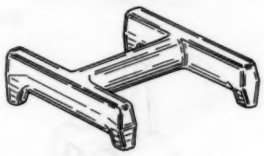


281,858
INSULATED SWITCH COVER FOR VEHICLE IGNITIONS
George F. Barrows, II, and Niela P. Barrows, both of 2909 E. Voltaire, Phoenix, Ariz. 85032
Filed Jun. 27, 1983, Ser. No. 508,114
Term of patent 14 years
U.S. Cl. D8—352

281,859
HOOK OR THE LIKE
Augusto A. Picozza, Johnston, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 9, 1983, Ser. No. 521,781
Term of patent 14 years
U.S. Cl. D8—367



281,860
LADING TIE ANCHOR
Rudolph E. Nadherny, Naperville, Ill., assignor to Ireco, Inc., Chicago, Ill.
Filed Nov. 4, 1983, Ser. No. 548,714
Term of patent 14 years
U.S. Cl. D8—382

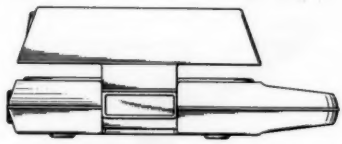


281,861
BOTTLE
David A. Jones, Kettering, Ohio, and Jon R. Zogg, New York, N.Y., assignors to The Drackett Company, Cincinnati, Ohio
Filed Jun. 14, 1983, Ser. No. 504,201
Term of patent 14 years
U.S. Cl. D9—377

281,862
BOTTLE
Paul Bertrand, Rouillac, France, assignor to Pernod Richard S.A., Paris, France
Filed Nov. 18, 1982, Ser. No. 442,686
Term of patent 14 years
U.S. Cl. D9—385

281,863
BOTTLE
Timothy J. Beechuk, Batavia, and Edwin F. Neu, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jun. 16, 1983, Ser. No. 504,927
Term of patent 14 years
U.S. Cl. D9—389

281,864
ELECTRONIC INSTRUMENT METER COVER
David S. Ashmun, Jr., Bellevue, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Jun. 13, 1983, Ser. No. 503,555
Term of patent 14 years
U.S. Cl. D10—80

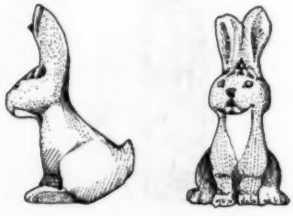


281,865
SURFACE MOUNT HOUSING FOR A SECURITY SYSTEM TRANSMITTER
William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.
Filed Sep. 26, 1983, Ser. No. 535,669
Term of patent 14 years
U.S. Cl. D10—106

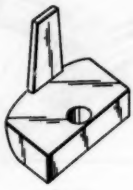
281,866
HOUSING FOR A TRANSMITTER FOR A SECURITY ALARM SYSTEM
William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.
Filed Sep. 26, 1983, Ser. No. 535,877
Term of patent 14 years
U.S. Cl. D10—106

281,867
GUITAR PICK MEDALLION
Daniel E. Swesey, 3833 S. Broadway Englewood, Englewood, Colo. 80110, and John G. Hiykel, 2875 Vane St., Omaha, Nebr. 68112
Filed Dec. 12, 1983, Ser. No. 560,859
Term of patent 14 years
U.S. Cl. D11—98

281,868
FIGURINE OF A WILD RABBIT
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 15, 1983, Ser. No. 532,507
Term of patent 14 years
U.S. Cl. D11—158



281,869
WATER LEVEL FLOAT FOR USE IN PLANTERS
Arthur R. Carlson, 401A Waverley Rd., East Malvern, Victoria 3144, Australia
Filed Mar. 4, 1983, Ser. No. 472,143
Term of patent 14 years
U.S. Cl. D11—164



281,870
MOTORCYCLE
Koji Nakano, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 18, 1982, Ser. No. 359,570
Claims priority, application Japan, Sep. 21, 1981, 56-42269
Term of patent 14 years
U.S. Cl. D12—110

281,871
MOTORCYCLE COMBINED RADIO AND SPEAKER SUPPORT
John A. Heiman, Waukesha, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Jan. 31, 1983, Ser. No. 462,711
Term of patent 14 years
U.S. Cl. D12—114

281,872

FRONT BUMPER FOR AUTOMOBILE

Richard A. Teague, Franklin; Robert C. Nixon; George M. Krispinsky, both of Huntington Woods; Jack E. Kenitz, New Baltimore, and Gary D. Guichard, Dearborn Heights, all of Mich., assignors to American Motors Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 432,154

Term of patent 14 years

U.S. Cl. D12—169

281,873

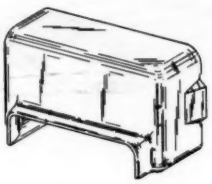
BUMPER CAP

John L. Milton, Vancouver, Canada, assignor to Milton Manufacturing, Inc., Richmond, Canada

Filed Jan. 4, 1983, Ser. No. 455,590

Term of patent 14 years

U.S. Cl. D12—172



281,874

BICYCLE BRAKE BLOCK

Andrew J. King, London, England, assignor to Madison Cycles Limited, London, England

Filed Mar. 28, 1983, Ser. No. 479,480

Claims priority, application United Kingdom, Oct. 11, 1982, 1009181

Term of patent 14 years

U.S. Cl. D12—180

281,875

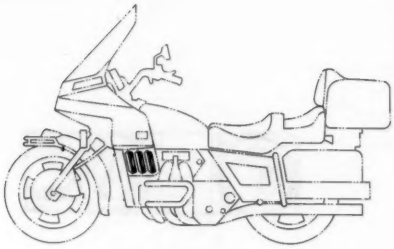
DUAL SET OF LOUVERS FOR INSERTION IN THE OPENINGS OF A MOTORCYCLE ENGINE FAIRING

Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 459,094, Jan. 19, 1983. This application Jun. 30, 1983, Ser. No. 509,960

Term of patent 14 years

U.S. Cl. D12—182



281,876

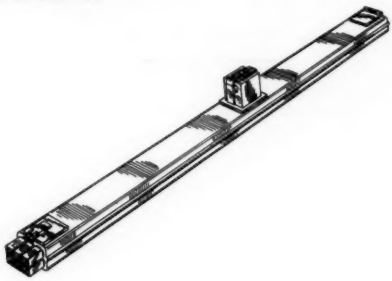
COMPONENT FOR A WIRING SYSTEM

Steven M. Kelly, Ligonier, Ind., assignor to Dunbar Furniture, Inc., Berne, Ind.

Filed Dec. 20, 1982, Ser. No. 450,893

Term of patent 14 years

U.S. Cl. D13—24



281,877

CASSETTE TAPE RECORDER

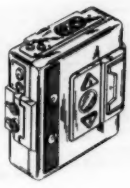
Hideaki Kurata; Kumio Mikami; Hiroshi Matsushima; Isao Wada, and Eiko Chikamatsu, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,208

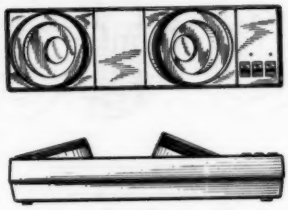
Claims priority, application Japan, Feb. 22, 1983, 58-7193

Term of patent 14 years

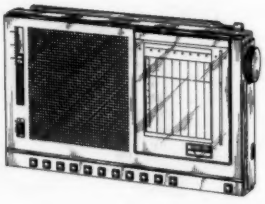
U.S. Cl. D14—6



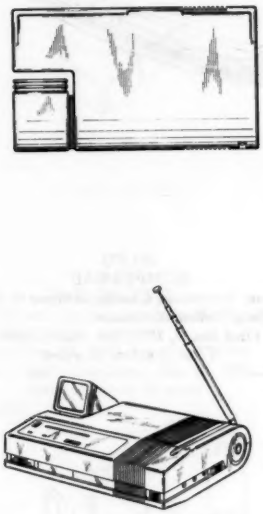
281,878
ACOUSTICALLY COUPLED MODEM
Yoshikazu Kawakami, Shiojiri, Japan, assignor to Kabushiki Kaisha Epson Corporation, Tokyo and Suwa Seikosha, Nagano, both of, Japan
Filed Apr. 15, 1982, Ser. No. 368,772
Claims priority, application Japan, Oct. 19, 1981, 56-46378
Term of patent 14 years
U.S. Cl. D14—57



281,879
RADIO RECEIVER
Jun Ishii, Tokyo, and Kanji Murai, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Aug. 19, 1983, Ser. No. 524,553
Claims priority, application Japan, Mar. 2, 1983, 58-8155
Term of patent 14 years
U.S. Cl. D14—70

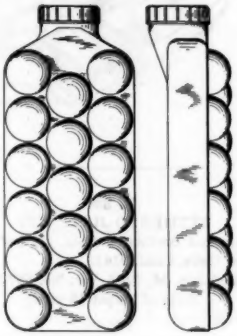


281,880
TELEVISION RECEIVER
Taisuke Kashima, Tokyo; Toru Kiyota, Tachikawa, and Takashi Fujii, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 15, 1983, Ser. No. 523,087
Claims priority, application Japan, May 25, 1983, 58-11971
Term of patent 14 years
U.S. Cl. D14—81



281,881
PLOW FRAME
James A. Swartzendruber, Bettendorf, Iowa; Gary A. Rehn, Geneseo, and Edwin C. Self, East Moline, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Jul. 1, 1983, Ser. No. 509,908
Term of patent 14 years
U.S. Cl. D15—33

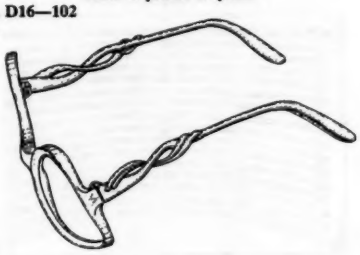
281,882
MOLD FOR MAKING ICE CUBES
Walter Prommer, Hardstr. 707, D-8510 Fürth, Fed. Rep. of Germany
Filed Aug. 17, 1983, Ser. No. 523,880
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, MR 7957
Term of patent 14 years
U.S. Cl. D15—90



281,883
REFRIGERATOR DOOR PANEL WITH EYE-LEVEL CONTROLS
Randy E. Carter, and Ernst R. Schmidt, both of c/o The Stolle Corporation, 1501 Michigan St., Sidney, Ohio 45365
Filed Aug. 8, 1983, Ser. No. 521,080
Term of patent 14 years
U.S. Cl. D15—91

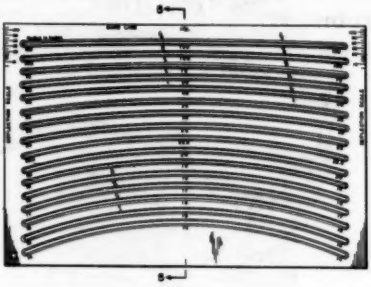
281,884
MOTOR SIDE COVER FOR A ROBATIC ARM
Donald D. Varner, Gilroy, and G. W. Rhodes, Los Altos Hills, both of Calif., assignors to Microbit Inc., Mountain View, Calif.
Filed Nov. 1, 1982, Ser. No. 438,402
Term of patent 14 years
U.S. Cl. D15—199

281,885
EYEGLASS FRAME
Richard Derviss, Long Island City, N.Y., assignor to Zyloware Corporation, Long Island City, N.Y.
Filed Aug. 10, 1983, Ser. No. 521,886
Term of patent 14 years
U.S. Cl. D16—102

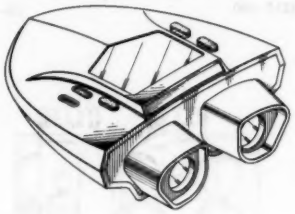


281,886
ELECTRONIC PRINTING CALCULATOR
Masaji Sawada; Hiroshi Sakaguchi; Shigeaki Hayashi, and Kazuo Yamada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1982, Ser. No. 452,837
Claims priority, application Japan, Jul. 2, 1982, 57-30065
Term of patent 14 years
U.S. Cl. D18—7

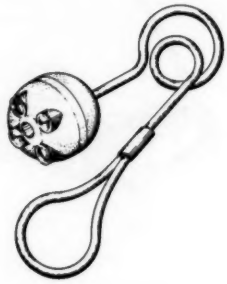
281,887
RADIUS CURVE TEMPLATE
Valdis Lapsins, 3312 Highgrove Pl., Dayton, Ohio 45429
Filed May 13, 1983, Ser. No. 494,538
Term of patent 14 years
U.S. Cl. D19—39



281,888
GAME HOUSING
Sozen Uozumi, and Minoru Sugiyama, both of Tokyo, Japan, assignors to Tomy Kogyo Company, Incorporated, Japan
Filed Feb. 4, 1983, Ser. No. 464,107
Term of patent 14 years
U.S. Cl. D21—13

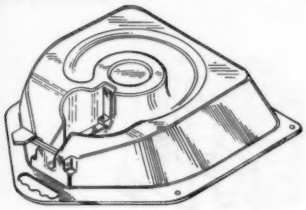


281,889
TETHERED JUMP TOY
Richard L. Bate and Bettina A. Bate, both of 13517 Contour Dr., Sherman Oaks, Calif. 91423
Filed Jun. 24, 1983, Ser. No. 507,566
Term of patent 14 years
U.S. Cl. D21—59

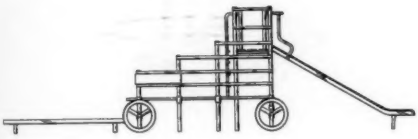


281,890
TOY MONSTER
James E. Routzong, Beverly, and Frank D. Ventura, Newburyport, both of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Sep. 22, 1983, Ser. No. 534,841
Term of patent 14 years
U.S. Cl. D21—174

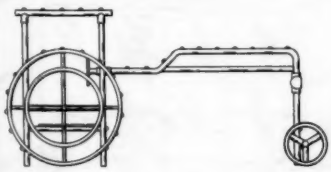
281,891
BALL TOSSING DEVICE
Ronald Topp, 4550 Kearney Villa Rd., Ste. 108, San Diego, Calif. 92123
Filed Aug. 17, 1983, Ser. No. 524,132
Term of patent 14 years
U.S. Cl. D21—210



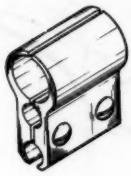
281,892
WAGON PLAYGROUND CLIMBER AND SLIDE
Keith A. Addleman, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.
Filed Oct. 24, 1983, Ser. No. 544,487
Term of patent 14 years
U.S. Cl. D21—244



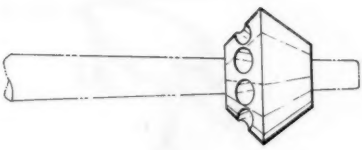
281,893
TRACTOR PLAYGROUND CLIMBER
Keith A. Addleman, Hillsdale, Mich., assignor to Quality Industries, Inc., Hillsdale, Mich.
Filed Oct. 24, 1983, Ser. No. 544,486
Term of patent 14 years
U.S. Cl. D21—245



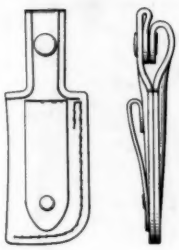
281,894
PISTOL TELESCOPE MOUNT
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Aug. 8, 1983, Ser. No. 521,229
Term of patent 14 years
U.S. Cl. D22—7



281,895
MUZZLE BRAKE
Clifford E. McLain, 7816 Manor House Dr., Fairfax Station, Va. 22039
Filed Sep. 21, 1983, Ser. No. 534,357
Term of patent 14 years
U.S. Cl. D22—7



281,896
KNIFE SHEATH
Victor E. DeMayo, Accord, N.Y., assignor to Gutmann Cutlery, Inc., Mount Vernon, N.Y.
Filed May 27, 1983, Ser. No. 498,905
Term of patent 14 years
U.S. Cl. D22—13



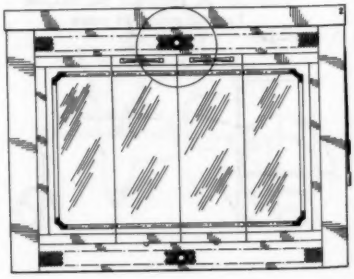
281,897
FISHING LURE
Gary A. Braathen, 22323 Long Blvd., Dearborn, Mich. 48124
Filed May 18, 1983, Ser. No. 495,634
Term of patent 14 years
U.S. Cl. D22—27

281,898
FISH LURE
Howard Shiverdecker, Lot 132, Park City S., Bloomington, Ill. 61701
Filed Jun. 30, 1983, Ser. No. 509,296
Term of patent 14 years
U.S. Cl. D22—28

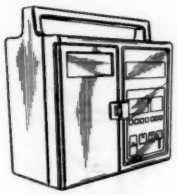
281,899
GARDEN SPRAYER
Rudolph M. Gunzel, Jr.; Thomas K. Hale, both of Glendale, and Moto Shimano, Los Angeles, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Jun. 8, 1983, Ser. No. 502,302
Term of patent 14 years
U.S. Cl. D23—18

281,900
LAWN SPRAYER
Rudolph M. Gunzel, Jr.; Thomas K. Hale, both of Glendale, and Moto Shimano, Los Angeles, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Jun. 8, 1983, Ser. No. 502,303
Term of patent 14 years
U.S. Cl. D23—18

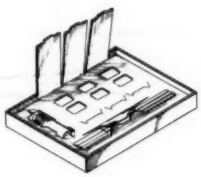
281,901
PICTURE WINDOW FIREPLACE SCREEN
Carl J. Demrick, Birmingham, Mich., and Ronald D. Hussey, Brampton, Canada, assignors to Shepherd Products Limited, Markham, Canada
Filed Apr. 21, 1983, Ser. No. 487,036
Term of patent 14 years
U.S. Cl. D23—138.3



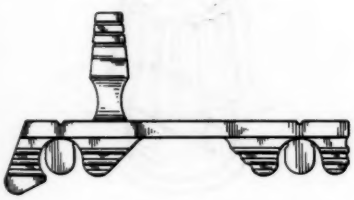
281,902
INTRAVENOUS METERING INSTRUMENT
James A. Loving; Howard F. Weber, and Clarence Zierhut, all of Dallas County, Tex., assignors to Quest Medical, Inc., Carrollton, Tex.
Filed Sep. 6, 1983, Ser. No. 529,583
Term of patent 14 years
U.S. Cl. D24—8



281,903
FECAL OCCULT BLOOD TEST KIT
Brian F. Duffy, Lynchburg, Va., assignor to C. B. Fleet Company, Inc., Lynchburg, Va.
Filed Feb. 9, 1983, Ser. No. 465,430
Term of patent 14 years
U.S. Cl. D24—21



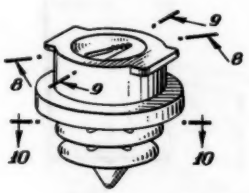
281,904
DENTAL IMPLANT
Leonard Linkow, 1530 Palisades Ave., Fort Lee, N.J. 07024, and Maurice Valen, 198-45 Foothill Ave., Holliswood, Queens, N.Y. 11423
Filed May 4, 1983, Ser. No. 441,847
Term of patent 14 years
U.S. Cl. D24—33



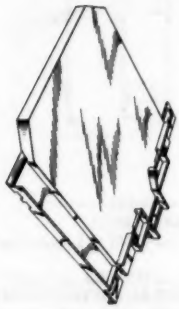
281,905
MULTI-PURPOSE SPLINT
Troy G. Nielsen, 2230 S. Highway 89-91, Logan, Utah 84321
Filed Sep. 27, 1983, Ser. No. 536,384
Term of patent 14 years
U.S. Cl. D24—64

281,906
DISPOSAL CONTAINER FOR HYPODERMIC NEEDLES
Richard F. Gianni, Danville, Calif., assignor to Biosafety Systems, Inc., San Diego, Calif.
Filed May 2, 1983, Ser. No. 490,864
Term of patent 14 years
U.S. Cl. D24—99

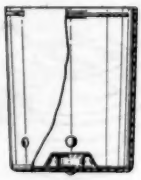
281,907
DISPOSAL CONTAINER FOR HYPODERMIC NEEDLES
Richard F. Gianni, Danville, Calif., assignor to Biosafety Systems, Inc., San Diego, Calif.
Filed May 2, 1983, Ser. No. 490,865
Term of patent 14 years
U.S. Cl. D24—99



281,908
ROOF SHINGLE
Lars O. Olsson, Doktor Lindhs gata 1, S-413 25 Göteborg, Sweden
Filed Apr. 21, 1983, Ser. No. 487,150
Claims priority, application Sweden, Oct. 22, 1982, 82-2533
Term of patent 14 years
U.S. Cl. D25—80



281,909
CANDLE LAMP
Ralph E. Meckling, Mansfield, Ohio, assignor to Merrico, Inc., Mansfield, Ohio
Filed Aug. 24, 1983, Ser. No. 525,946
Term of patent 14 years
U.S. Cl. D26—11

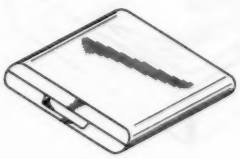


281,910
CANDLESTICK
Johannes Dinnebier, Wuppertal, Fed. Rep. of Germany, and Timo Sarpaneva, Minusio, Switzerland, assignors to Rosenthal Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 8, 1983, Ser. No. 521,128
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 7248
Term of patent 14 years
U.S. Cl. D26—11

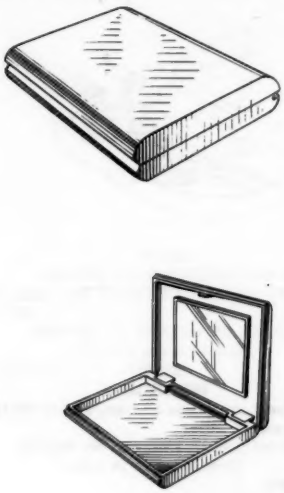
281,911
CANDLE LAMP
William J. Williams, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.
Filed Aug. 15, 1983, Ser. No. 523,386
Term of patent 14 years
U.S. Cl. D26—11

281,912
COMBINED MOTORCYCLE ROTOR COVER LIGHT AND AIR SCOOP
Thomas H. Rudd, Wayzata, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed Mar. 23, 1983, Ser. No. 478,417
Term of patent 14 years
U.S. Cl. D26—28

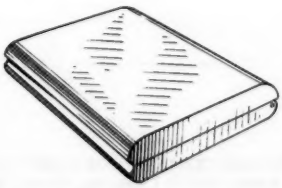
281,913
COSMETIC CASE
Dieter Bakic, Munich, Fed. Rep. of Germany, assignor to Revlon, Inc., New York, N.Y.
Filed Nov. 22, 1982, Ser. No. 443,549
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1982, 11 AR 1979/82
The portion of the term of this patent subsequent to Sep. 21, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—83

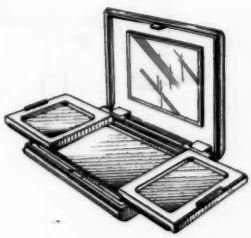


281,914
COSMETIC COMPACT
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.
Filed Sep. 15, 1983, Ser. No. 532,552
Term of patent 14 years
U.S. Cl. D28—83

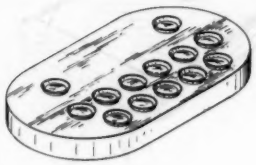


281,915
COSMETIC COMPACT WITH SLIDE-OUT DRAWERS
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.
Filed Sep. 15, 1983, Ser. No. 532,553
Term of patent 14 years
U.S. Cl. D28—83

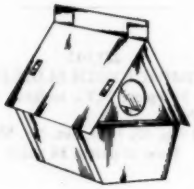




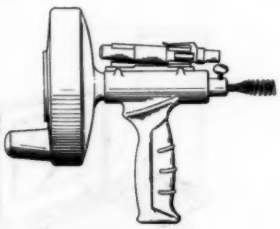
281,916
LIPSTICK BLENDING MACHINE
Eleanor R. Spierto, Midtown Towers, Apartment No. 1202, 643 Liberty Ave., Pittsburgh, Pa. 15222
Filed Nov. 28, 1983, Ser. No. 555,656
Term of patent 14 years
U.S. Cl. D28—99



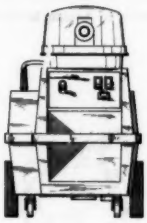
281,917
BIRDHOUSE
William E. Myers, and Sophia J. Myers, both of 730 Huntington Ct., Algonquin, Ill. 60102
Filed Dec. 27, 1983, Ser. No. 565,726
Term of patent 14 years
U.S. Cl. D30—3

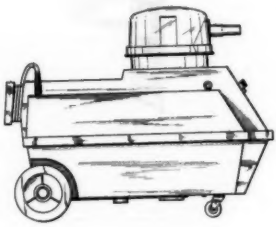


281,918
COMBINED PIPE CLEANER AND LAMP THEREFOR
Lawrence E. Levine, 3147 N. Cambridge, Chicago, Ill. 60657
Filed Jul. 7, 1983, Ser. No. 511,770
Term of patent 14 years
U.S. Cl. D32—14

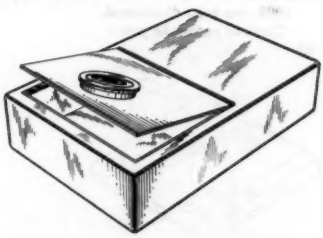


281,919
HOT WATER EXTRACTION CARPET CLEANER
Donald V. Balley, Hamilton County, Ind., and William E. Bartasevich, Portage County, Ohio, assignors to Blue Lustre Home Care Products, Inc., Indianapolis, Ind.
Filed Dec. 5, 1983, Ser. No. 558,094
Term of patent 14 years
U.S. Cl. D32—21

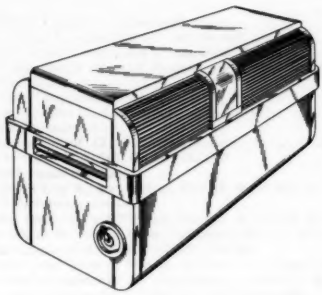




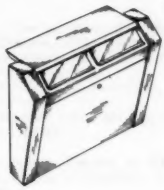
281,920
SAFE
Cemal Lacka, 13 Gayle St., Middletown, N.J. 07748
Filed Sep. 30, 1982, Ser. No. 430,430
Term of patent 14 years
U.S. Cl. D99—28



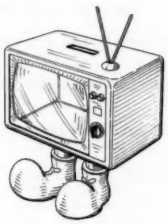
281,921
MOBILE BANK TELLER STATION
Paul F. Losi, Toms River, N.J., assignor to Chemical New York Corporation, New York, N.Y.
Filed Oct. 14, 1983, Ser. No. 542,259
Term of patent 14 years
U.S. Cl. D99—28



281,922
CABINET FOR AUTOMATED BANK TELLER MACHINE
Ned D. Brown, 5111 Webster St., Dayton, Ohio 45414
Filed Sep. 19, 1983, Ser. No. 533,520
Term of patent 14 years
U.S. Cl. D99—28



281,923
MONEY SAVING CONTAINER
Eliot M. Glick, 120 Avenue Rd., Toronto, Ontario, Canada (M5R 2H4)
Filed Sep. 15, 1983, Ser. No. 532,627
Term of patent 14 years
U.S. Cl. D99—37



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Lo, Young S., 4,560,510, Cl. 260-244.400.

A&M Engineered Composites Corporation: *See*—
Plumley, Ralph M.; and Renaud, Henry H., Jr., 4,560,523, Cl. 264-102.000.

A. O. Smith Corporation: *See*—
Ryan, William E., 4,560,525, Cl. 264-136.000.

A/S Niro Atomizer: *See*—
Caspersen, Leif D.; Felsvang, Karsten S.; and Schwartzbach, Christian, 4,560,543, Cl. 423-242.000.

Abar Ipsen Industries: *See*—
Moller, Craig A.; and Wolter, Eric H., 4,560,348, Cl. 432-77.000.

Abbott Laboratories: *See*—
Parks, James A.; and Plattner, Jacob J., 4,560,558, Cl. 514-379.000.

Abe, Norio, to Mitsubishi Denki Kabushiki Kaisha. Frequency determining apparatus. 4,561,021, Cl. 358-158.000.

Abe, Ryozo; and Sakurai, Masaki, to Victor Company of Japan, Ltd. Reproducing apparatus for reproducing recorded signals from a rotary recording medium. 4,561,026, Cl. 358-336.000.

Abe, Toshiyuki: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.

Abu-Isa, Ismat A.; Wang, Chen-Shih; McCarthy, Daniel P.; and Patterson, David W., to General Motors Corporation. Bonding EPDM gaskets to filled nylon heat exchanger parts. 4,559,688, Cl. 29-157.30R.

Acampora, Alfonse, to RCA Corporation. Pre-emphasis and de-emphasis filters for a composite NTSC format video signal. 4,561,012, Cl. 358-11.000.

Ackerman, Charles B., to Solavolt International. Apparatus and method for redirecting an incident beam. 4,560,244, Cl. 350-486.000.

ACO Severin Ahlmann GmbH & Co. KG: *See*—
Karbstein, Peter, 4,560,302, Cl. 404-4.000.

Adachi, Makoto: *See*—
Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, 4,560,684, Cl. 514-221.000.

Adams, Jay J. Easily releasable and sealable sanitary lid-spout. 4,560,081, Cl. 220-257.000.

Adams, William V.; and Avard, Duane A., to Durametallic Corporation. Mechanical seal assembly with coolant circulation structure. 4,560,173, Cl. 277-15.000.

Adell, Robert, to U.S. Product Development Co. Method of making edge guard. 4,559,741, Cl. 49-462.000.

Adelstein, Gilbert W.; and Chorvat, Robert J., to G. D. Searle & Co. Substituted 5-phenyl-5-(aminoalkyl)-1,3-diazabicyclo[4.4.0]decan-4-ones and 5-phenyl-5-(aminoalkyl)-1,3-diazabicyclo[4.4.0]dec-2-en-4-ones. 4,560,754, Cl. 544-282.000.

Adler, Alan J. Gliding ring. 4,560,358, Cl. 446-46.000.

Affeld, Klaus; Mohnhaupt, Axel; and Jorn, Frank, to Thoratec Laboratories Corporation. Safety control valve for an artificial heart. 4,559,648, Cl. 623-3.000.

Agarwal, Suresh C., to Babcock & Wilcox Company, The. Automated catalyst regeneration in a reactor. 4,560,815, Cl. 585-259.000.

Agency of Industrial Science & Technology: *See*—
Nara, Koichi, 4,560,288, Cl. 374-201.000.

Ahlen, Karl-Gustav; Bergstrom, Per-Olof; and Wallgren, Hans A., to S.R.M. Hydromekanik Aktiebolag. Power shift planetary gear transmission. 4,559,849, Cl. 74-761.000.

Ahrens Agricultural Industries Co.: *See*—
Ahrens, Claude W., 4,559,905, Cl. 119-73.000.

Ahrens, Claude W., to Ahrens Agricultural Industries Co. Livestock watering tank. 4,559,905, Cl. 119-73.000.

Aida Engineering, Ltd.: *See*—
Tezuka, Yoshitomo; Nakagawa, Takeo; and Kobayashi, Kazusuke, 4,560,622, Cl. 428-599.000.

Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, to Hitachi, Ltd. Method of producing material for superconductor. 4,560,404, Cl. 75-0.50C.

Air Monitor Corporation: *See*—
DeBaun, Kenneth W., 4,559,835, Cl. 73-861.660.

Air Preheater Company, Inc., The: *See*—
Counterman, Wayne S., 4,559,998, Cl. 165-109.100.

Air Products and Chemicals, Inc.: *See*—
Ford, Michael E.; and Johnson, Thomas A., 4,560,798, Cl. 564-503.000.
Schuck, Thomas W., 4,559,786, Cl. 62-55.000.
Spence, David C.; and Schwartz, William A., 4,560,824, Cl. 585-662.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hara, Sohichi; and Matsuzaki, Minori, 4,559,685, Cl. 29-156.50R.
Sakakibara, Naoji; Amano, Hiroyuki; Morioka, Hiroaki; and Kawata, Shoji, 4,559,864, Cl. 91-454.000.
Yamaguchi, Yuji; and Kawai, Shinji, 4,559,964, Cl. 137-107.000.

Aisin-Warner, Ltd.: *See*—
Sakakibara, Shiro, 4,559,850, Cl. 74-868.000.

Aisslinger, Dieter E.: *See*—
Pusch, Gunter; Hoffmann, Alexander; and Aisslinger, Dieter E., 4,560,608, Cl. 428-196.000.

Ajima, Takashi: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,560,642, Cl. 430-313.000.

Ajinomoto Co., Inc.: *See*—
Kurahashi, Osamu; Kamada, Masahiro; and Enei, Hitoshi, 4,560,652, Cl. 435-108.000.
Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, 4,560,654, Cl. 435-115.000.
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.

Akahane, Naoto; Yamaguchi, Yoshitake; Matsuura, Takeshi; and Watatani, Seiji, to Hitachi Maxell Ltd. Magnetic recording medium. 4,561,034, Cl. 360-134.000.

Akahori, Hiroyuki: *See*—
Tsujimoto, Michihiro; Asano, Makoto; Hasegawa, Kiyoharu; and Akahori, Hiroyuki, 4,561,000, Cl. 346-208.000.

Akebono Brake Industry Co., Ltd.: *See*—
Watanabe, Namio, 4,560,035, Cl. 188-72.800.

Akimoto, Koji: *See*—
Kojo, Hidehiko; Akimoto, Koji; and Urihara, Kazuhiro, 4,560,732, Cl. 525-481.000.

Akio, Matsumoto: *See*—
Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, 4,560,916, Cl. 322-86.000.

Akita, Eiichi: *See*—
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, 4,560,750, Cl. 544-21.000.

Akzo NV: *See*—
Stoldt, August; Stemig, Heinz; Breidohr, Hans-Gunther; and Martin, Manfred, 4,559,884, Cl. 112-262.100.

Alberto, Vicente S. D., to Union Carbide Corporation. Polyvinyl-coated cathode collector for cells employing liquid cathodes. 4,560,632, Cl. 429-196.000.

Alcan International Limited: *See*—
Sivilotti, Olivo G., 4,560,449, Cl. 204-70.000.

Aldebert, Pierre, to Quartz et Silice. Large bandwidth optical fibers. 4,560,247, Cl. 350-96.300.

Alexander, Douglas: *See*—
Koblasz, Arthur; Hollister, James; and Alexander, Douglas, 4,559,979, Cl. 141-9.000.

Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co.: *See*—
Schwab, Manfred F., 4,559,806, Cl. 72-391.000.

Allan, G. Graham; Freepons, Donald E.; and Crews, George M., to Melamine Chemicals, Inc. Fertilizer compositions, processes of making them and processes of using them. 4,560,400, Cl. 71-29.000.

Allied Corporation: *See*—
Bedell, John R.; Smith, Robert W.; and Liebermann, Howard H., 4,559,992, Cl. 164-463.000.
Bolenbaugh, Daniel L.; Wegh, John R.; and Smith, Roger L., 4,560,039, Cl. 188-73.450.
Gumkowski, Bert A.; and Oltmanns, Roger W., Jr., 4,560,037, Cl. 188-73.380.
Sherman, William E., II; and Behrmann, Edgar A., 4,560,368, Cl. 464-112.000.
Steer, John E.; and Crumb, Donald A., 4,559,781, Cl. 60-562.000.
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,560,797, Cl. 564-267.000.

Allis-Chalmers Corporation: *See*—
O'Dell, Leonard J., 4,560,396, Cl. 55-287.000.

Alpha Ocean Systems, Inc.: *See*—
Ogg, Robert D., 4,559,893, Cl. 114-304.000.

Alps Electric Co., Ltd.: *See*—
Aratsu, Shuichi, 4,560,996, Cl. 346-139.00R.
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,560,295, Cl. 400-637.100.
Sugawara, Fukuo; and Iwane, Yasuhiko, 4,560,294, Cl. 400-145.000.
Tsukahara, Michiyoshi, 4,561,039, Cl. 361-328.000.

Alroy & Stanley Associates, Inc.: *See*—
Stanley, Smith B.; and Alroy, Yoram A., 4,560,258, Cl. 351-115.000.

Alroy, Yoram A.: *See*—
Stanley, Smith B.; and Alroy, Yoram A., 4,560,258, Cl. 351-115.000.

Alsthom-Atlantique: *See*—
Perret, Rene, 4,560,028, Cl. 181-288.000.

Aluminum Company of America: *See—*
Levendusky, Thomas L.; and Benson, Arthur, 4,560,850, Cl. 219-10.55E.
Alves, Roger J.; and Reyes, Daniel W., to Alves, Roger J. Radio conversion panel. 4,560,124, Cl. 248-27.100.
Amamoto, Taro: *See—*
Nakata, Kazuo; Ishikawa, Tsuneo; Amamoto, Taro; and Kawamura, Toshihiko, 4,560,544, Cl. 423-266.000.
Amano, Hiroyuki: *See—*
Sakakibara, Naoji; Amano, Hiroyuki; Morioka, Hiroaki; and Kawata, Shoji, 4,559,864, Cl. 91-454.000.
Amano, Matsuo: *See—*
Hirayama, Takeshi; Amano, Matsuo; Sasayama, Takao; and Baba, Shirou, 4,561,056, Cl. 364-431.050.
American Standard Inc.: *See—*
Bozio, Robert P., 4,560,953, Cl. 331-108.00D.
Amoco Corporation: *See—*
Warmack, Ralph E., 4,561,074, Cl. 367-46.000.
AMP Incorporated: *See—*
Billman, Timothy B.; Coller, James R.; and Marpoe, Gary R., Jr., 4,560,218, Cl. 339-17.0CF.
Burns, Carmen; and Grabbe, Dimitry, 4,560,826, Cl. 174-52.0FP.
Maack, Werner; Gerst, Michael; and Liedloff, Manfred, 4,559,702, Cl. 29-759.000.
Michael, George W., III, 4,559,704, Cl. 30-90.100.
Olsson, Billy E., 4,560,221, Cl. 339-75.0MP.
Weisenburger, Lawrence P., 4,560,224, Cl. 339-97.00C.
Ampex Corporation: *See—*
Williams, Marshall, 4,560,983, Cl. 340-825.000.
Ampferer, Herbert, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Turbocharged internal combustion engine with adjustable length pipe sections. 4,559,783, Cl. 60-605.000.
Anand, Kranti; and Strain, Robert J., to Fairchild Camera & Instrument Corporation. Ion implantation to increase emitter energy gap in bipolar transistors. 4,559,696, Cl. 29-576.00B.
Anco Engineers, Incorporated: *See—*
Ibanez, Paul; Stoessel, John; and Barrett, Donald C., 4,560,016, Cl. 177-210.00R.
Anderson, Frank E.; and Martin, Robert A. Sanitizer system for beverage can filler machine. 4,559,961, Cl. 134-166.00R.
Anderson, Lawrence V.: *See—*
Newendorp, Bruce C.; Sturtz, Terry L.; and Anderson, Lawrence V., 4,559,847, Cl. 74-710.500.
Anderson, Russell Y.: *See—*
Jackson, Ronald M.; Olin, Daniel C.; and Anderson, Russell Y., 4,560,981, Cl. 340-747.000.
Andersson, Ulf. Regulator for regulating the output pressure of a motor driven pump. 4,560,322, Cl. 417-26.000.
Ando, Moritoshi; Mita, Kikuo; and Kakinoki, Yoshikazu, to Fujitsu Limited. Method and apparatus for inspecting plated through holes in printed circuit boards. 4,560,273, Cl. 356-237.000.
Ando, Toshihiko: *See—*
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.
Andow, Fumio; and Inagaki, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying system. 4,561,120, Cl. 455-612.000.
Andrews, Edward W.; and Lambert, Thomas W., to General Electric Company. Film-based dual energy radiography. 4,561,054, Cl. 364-414.000.
Andrews, Winston A.; and Carpenter, Larry, to Medical Research Associates Ltd. #2. Sterile handle cover for surgical lamp. 4,559,671, Cl. 16-111.00R.
Andrieux, Bernard, to Societe Anonyme Dite-Delas-Weir. Modular bundle of tubes for a steam condenser, and a steam condenser using such modular bundles. 4,559,996, Cl. 165-76.000.
Angelsen, Bjorn A. J.; and Kristoffersen, Kjell, to Vingmed A/S Inkognitogt. Method of ultrasonically measuring blood flow velocity. 4,559,952, Cl. 128-663.000.
Anorad Corporation: *See—*
Chitayat, Anwar, 4,560,911, Cl. 318-135.000.
Anphar S.A.: *See—*
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,560,545, Cl. 423-430.000.
ANT Nachrichtentechnik GmbH: *See—*
Tegel, Othmar; and Gill, Hardial S., 4,560,952, Cl. 331-107.0DP.
Anthony, Zacharias. Poker game. 4,560,171, Cl. 273-269.000.
Antonovsky, Ariel D., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for image formation. 4,560,872, Cl. 250-310.000.
Aono, Katsutoshi: *See—*
Totani, Tetsushi; Aono, Katsutoshi; and Komura, Michihiro, 4,560,781, Cl. 556-137.000.
Aoyagi, Juuro; Ichikawa, Toshiji; Koide, Mikio; and Shimomura, Takeshi, to Terumo Kabushiki Kaisha. Compositions of polyvinyl chloride and tetracarboxylic tetraesters and medical articles thereof. 4,560,720, Cl. 524-288.000.
Aoyama, Masaharu: *See—*
Yonezawa, Toshio; and Aoyama, Masaharu, 4,561,009, Cl. 357-67.000.
Aoyama, Steven, to Wilson Sporting Goods Co. Golf ball. 4,560,168, Cl. 273-232.000.
Applegate, Barry G.; Carter, David C. M.; and Heybourn, Frank, to Molins Limited. Packet handling apparatus. 4,560,057, Cl. 198-347.000.
Applied Polymer Technology, Inc.: *See—*
Hinrichs, Richard J.; and Thuen, Judy, 4,559,810, Cl. 73-54.000.
Applied Power Inc.: *See—*
Miller, Douglas P., 4,560,152, Cl. 269-24.000.
Applied Technologies Associates: *See—*
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,559,713, Cl. 33-302.000.
Arai, Nobushige, to Sharp Kabushiki Kaisha. Self-cleaning coating compositions and cooking apparatus coated therewith. 4,560,620, Cl. 428-565.000.
Arai, Sakuji; Sato, Katsuaki; Kochi, Susumu; and Hishida, Hiroaki, to Honda Giken Kogyo Kabushiki Kaisha. Catalytic converter mounting structure for engines. 4,559,776, Cl. 60-280.000.
Arai, Takao: *See—*
Kikegawa, Shinko; Arai, Takao; Yamamoto, Norio; and Ozaki, Kiyoharu, 4,560,414, Cl. 106-281.00R.
Arai, Yuko: *See—*
Katsumata, Hideo; Katsumata, Shigeo; Ishii, Shinzo; and Arai, Yuko, 4,560,661, Cl. 435-183.000.
Arakawa, Takeshi; and Ikeda, Hiroki, to NEC Corporation. Memory system handling a plurality of bits as a unit to be processed. 4,561,072, Cl. 365-230.000.
Araki, Hidejiro; and Kodama, Ikuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of preventing a defective weft yarn from being woven in a fabric in a shuttleless loom. 4,559,976, Cl. 139-435.000.
Aratsu, Shuichi, to Alps Electric Co., Ltd. Pen recorder. 4,560,996, Cl. 346-139.00R.
Arbuthnot, Gerald: *See—*
Walling, Jorg-Hein; Arbuthnot, Gerald; and Shannon, Michael A., 4,560,521, Cl. 264-24.000.
Ardini, Joseph L., Jr.: *See—*
Rodman, Paul K.; Ardini, Joseph L., Jr.; and Papworth, David B., 4,561,051, Cl. 364-200.000.
Arditty, Herve : *See—*
Papuchon, Michel; Arditty, Herve ; and Puech, Claude, 4,560,867, Cl. 250-225.000.
Argiles & Mineraux AGS-BMP: *See—*
Geirnaert, Gilles, 4,560,660, Cl. 435-176.000.
Arimoto, Satomi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker of spiral arc type. 4,560,848, Cl. 200-147.00A.
Arioli, Amedea; and Arioli, Lorenza, to Arioli & C. S.r.l. Folding device for machines for treating folded fabrics, particularly printed fabrics. 4,560,099, Cl. 226-105.000.
Arioli & C. S.r.l.: *See—*
Arioli, Amedea; and Arioli, Lorenza, 4,560,099, Cl. 226-105.000.
Arioli, Lorenza: *See—*
Arioli, Amedea; and Arioli, Lorenza, 4,560,099, Cl. 226-105.000.
Ariyoshi, Haruki: *See—*
Ikehara, Yasunobu; Ariyoshi, Haruki; and Hidaka, Ryoichi, 4,560,406, Cl. 75-30.000.
Arizona State University: *See—*
Pettit, George R.; and Herald, Cherry L., 4,560,774, Cl. 549-267.000.
Armenta, Richard, to Syntex (U.S.A.) Inc. Homogeneous enzyme immunoassay for ferritin. 4,560,648, Cl. 435-7.000.
Armor, John N.: *See—*
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,560,797, Cl. 564-267.000.
Armstrong, Bruce G., to Raytheon Company. Integrated circuit memory. 4,561,070, Cl. 365-227.000.
Arnaud, Fabrice R.: *See—*
Helderle, Paul M.; Arnaud, Fabrice R.; and Le Nours, Yannick, 4,560,005, Cl. 166-332.000.
Arnold, Edward C., to UOP Inc. Carboxyl anchored immobilized antibodies. 4,560,504, Cl. 260-112.00B.
Arnold, Stephen R.: *See—*
Brockway, Bert R.; and Arnold, Stephen R., 4,559,955, Cl. 131-198.200.
Asahi Denka Kogyo K.K.: *See—*
Kojo, Hidehiko; Akimoto, Koji; and Urihara, Kazuhiro, 4,560,732, Cl. 525-481.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Fujiwara, Takashi; and Ishitobi, Tamio, 4,560,743, Cl. 528-348.000.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,560,755, Cl. 544-363.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Fukui, Tsutomu; and Shirai, Tomoyuki, 4,561,013, Cl. 358-22.000.
Kitazawa, Toshiyuki; Morisawa, Tahei; and Takahashi, Norimichi, 4,560,264, Cl. 354-219.000.
Ohkura, Zenichi; and Kohmoto, Shinsuke, 4,560,237, Cl. 350-255.000.
Asai, Kohtaro: *See—*
Murakami, Tokumichi; and Asai, Kohtaro, 4,560,977, Cl. 340-347.0AD.
Asano, Makoto: *See—*
Tsujimoto, Michihiro; Asano, Makoto; Hasegawa, Kiyoharu; and Akahori, Hiroyuki, 4,561,000, Cl. 346-208.000.
Asano, Takateru: *See—*
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, 4,560,640, Cl. 430-280.000.
Asao, Motoaki; and Nanko, Hideaki, to Sanyo Electric Co., Ltd. Digital signal receiver. 4,561,100, Cl. 375-99.000.
ASEA Aktiebolag: *See—*
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,560,868, Cl. 250-227.000.

Ashworth, Robert A., to Florida Progress Corporation. Alternative fuel comprised of sewage sludge and a liquid hydrocarbon fuel oil. 4,560,391, Cl. 44-51.000.
Asmus, Stewart. Picture hanging tool. 4,559,690, Cl. 29-270.000.
Aso, Tomio: *See—*
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,560,295, Cl. 400-637.100.
Asturias, Carlos E. R. Ethanol production from fermentation of sugar cane. 4,560,659, Cl. 435-162.000.
AT&T Bell Laboratories: *See—*
Prezas, Dimitrios P., 4,561,102, Cl. 381-49.000.
Turner, Jonathan S., 4,561,090, Cl. 370-60.000.
AT&T Information Systems Inc.: *See—*
Carson, Robert A.; Fenton, Francis M.; and Jones, David F., 4,560,837, Cl. 179-18.0BD.
AT&T Technologies, Inc.: *See—*
Lord, Herbert A., 4,560,420, Cl. 148-1.500.
Atago Bussan Co. Ltd.: *See—*
Yoshioka, Shigeyoshi, 4,560,276, Cl. 356-334.000.
Atkinson, Gerald O., to Hughes Tool Company-USA. Method for shanking rock bits. 4,559,852, Cl. 76-108.00A.
Atlantic Richfield Company: *See—*
Davis, Gerald E., 4,560,541, Cl. 423-126.000.
Gaffney, Anne M., 4,560,823, Cl. 585-654.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,560,821, Cl. 585-500.000.
Atochem: *See—*
Ollivier, Jean-Paul; and Vinatier, Bernard, 4,560,613, Cl. 428-309.900.
Atsugi, Takeo; Samejima, Shuuichi; and Masamura, Tatsurou, to Nippon Telegraph & Telephone Public Corporation. Clock recovery system for TDMA satellite communication system. 4,561,099, Cl. 375-97.000.
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, to Meiji Seika Kaisha Ltd. Cephem compounds and process for preparing the same. 4,560,750, Cl. 544-21.000.
Attig, Thomas G.; Graham, Anne M.; and Pesa, Frederick, to Standard Oil Company, The. Ruthenium-copper-containing, activated-carbon-supported catalyst and process for making alcohol using same. 4,560,672, Cl. 502-183.000.
Atushi, Yahagi: *See—*
Teruyuki, Ohba; Kazuo, Arai; Atushi, Yahagi; and Shigeru, Iwakoshi, 4,560,109, Cl. 239-583.000.
Atwood, Charles W.: *See—*
Williams, Rodger W.; Atwood, Charles W.; and Morgan, Lawrence J., 4,560,144, Cl. 251-344.000.
Audoin, Michel: *See—*
Gerard, Jean-Louis; Berthet, Pierre; Bricot, Claude; and Audoin, Michel, 4,561,082, Cl. 369-45.000.
Augello, Daniel: *See—*
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, 4,560,885, Cl. 307-10.00R.
Augoyard, Jean-Pierre, to G.T.M.-Entrepose. Process for forming a prestress anchorage by drawing a steel sleeve over a metal core. 4,560,424, Cl. 148-150.000.
AURORA Konrad G. Schulz GmbH & Co.: *See—*
Schulz, Joachim; and Thelen, Werner, 4,560,103, Cl. 236-13.000.
Autoflug GmbH: *See—*
Zeumer, Monika; and Straszewski, Klaus, 4,560,204, Cl. 297-483.000.
Automation Industries, Inc.: *See—*
Martens, George D., 4,559,825, Cl. 73-622.000.
Auvil, Steven R.: *See—*
Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., 4,560,775, Cl. 549-326.000.
Avard, Duane A.: *See—*
Adams, William V.; and Avard, Duane A., 4,560,173, Cl. 277-15.000.
Ayerbe, Andre : *See—*
Porta, Augusto; Schaub, Maurice; Ayerbe, Andre ; and Bunter, Guy, 4,560,455, Cl. 204-130.000.
Baba, Shirou: *See—*
Hirayama, Takeshi; Amano, Matsuo; Sasayama, Takao; and Baba, Shirou, 4,561,056, Cl. 364-431.050.
Babcock & Wilcox Company, The: *See—*
Agarwal, Suresh C., 4,560,815, Cl. 585-259.000.
Domian, Henry A.; and Weber, Charles M., 4,560,854, Cl. 219-121.0EW.
Bacon, Forrest C., to Ex-Cell-O Corporation. Inspection and rejection apparatus. 4,559,754, Cl. 53-53.000.
Badenia GmbH Stepeedeckenfabrik: *See—*
Molders, Claus, 4,559,673, Cl. 19-82.000.
Badge, Roger: *See—*
Negus, Paul D.; Ng, Tak C.; Badge, Roger; and Cowen, David W., 4,560,943, Cl. 329-103.000.
Baer, Karl: *See—*
Menig, Helmuth; Fischer, Martin; and Baer, Karl, 4,560,769, Cl. 548-560.000.
Bailey, Maureen L.: *See—*
Drozd, Jan W.; and Bailey, Maureen L., 4,560,657, Cl. 435-123.000.
Bailey, William J.: *See—*
Van Becelaere, Robert M.; and Bailey, William J., 4,559,867, Cl. 98-1.000.
Bair, Eugene C.; and Crawford, Delmar E., to General Electric Company. Method of treating a loose wound core, method of fabricating a loose wound core, and method of operating apparatus. 4,559,698, Cl. 29-598.000.
Baker, Ian M., to U.S. Philips Corporation. Method of manufacturing an infrared radiation imaging device. 4,559,695, Cl. 29-572.000.
Baker Oil Tools, Inc.: *See—*
Beimgraben, Herbert W., 4,560,013, Cl. 175-73.000.
Baker, Paul E., to Immunex Corporation. Serum-free cell culture medium and process for making same. 4,560,655, Cl. 435-241.000.
Bakola-Christianopoulou, Maria: *See—*
Papageorgiou, Vassilios P.; Bakola-Christianopoulou, Maria; and Tsipis, Constantinos A., 4,560,782, Cl. 556-137.000.
Bakshi, Kiran R.; D'Souza, Adrian; and Sabourin, Edward T., to Gulf Research & Development Co. Isolation of m,m'-dinitrobenzophenone. 4,560,800, Cl. 568-306.000.
Baldszun, Karl; Grazianski, Thomas; and Kuhn, Gunther, to Eppendorf Geratebau Netheler & Hinz GmbH. Cell for mixing operations and for optical examination. 4,560,269, Cl. 356-246.000.
Ball Corporation: *See—*
Smith, Eugene F.; and Nguyen, Tuan A., 4,559,801, Cl. 72-348.000.
Ballerin, Edmond: *See—*
Ballerin, Jean-Paul; Georgelin, Alexandre; and Ballerin, Edmond, 4,559,918, Cl. 124-78.000.
Ballerin, Jean-Paul; Georgelin, Alexandre; and Ballerin, Edmond, to Faiveley Entreprises. Ball-throwing device with ball throwing heads and ball conveying system including Y-junction. 4,559,918, Cl. 124-78.000.
Balz, Werner: *See—*
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, 4,560,456, Cl. 204-159.140.
Banasiak, Dennis S., to Phillips Petroleum Company. Disproportionation of functional olefins. 4,560,792, Cl. 560-261.000.
Banbury, John R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Color head up display system. 4,560,233, Cl. 350-3.700.
Banks, Bruce A.: *See—*
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,560,577, Cl. 427-38.000.
Banton, Martin E.: *See—*
Yip, Kwok-leung; and Banton, Martin E., 4,561,023, Cl. 358-208.000.
Baravian, Jean, to Rhone-Poulenc Fibres. Process for the treatment of non-woven sheets and the product obtained. 4,560,385, Cl. 8-115.700.
Barbaric, Zoran L.; and Nelson, Robert S., to University of California, Regents of the. High-efficiency X-radiation converters. 4,560,882, Cl. 250-487.100.
Barbee, Robert B.: *See—*
Davis, Burns; and Barbee, Robert B., 4,560,741, Cl. 528-302.000.
Barber, William F. All-terrain vehicle with tractive roller assembly. 4,560,019, Cl. 180-9.320.
Barbetta, Angelo J.: *See—*
Hoffend, Thomas R.; and Barbetta, Angelo J., 4,560,635, Cl. 430-106.600.
Bardina, Juan; and Gonzalez, Mikel, to Technomex Development, Ltd. Decontamination method for semiconductor wafer handling equipment. 4,560,417, Cl. 134-1.000.
Bardle Servovalve Company: *See—*
Nicholson, Robert D., 4,560,969, Cl. 335-272.000.
Barlow, Craig B.: *See—*
Yung, Kenneth K.; Barlow, Craig B.; and Glass, Joe R., 4,560,538, Cl. 423-3.000.
Barmag Barmer Maschinenfabrik AG: *See—*
Oberstrass, Detlev, 4,559,775, Cl. 57-340.000.
Runkel, Walter; Lenk, Erich; and Bauer, Karl, 4,560,347, Cl. 432-59.000.
Barr & Stroud Limited: *See—*
Craig, Robert L.; Hunter, Iain; and Packard, Paul D., 4,561,063, Cl. 364-559.000.
Barrett, Donald C.: *See—*
Ibanez, Paul; Stoessel, John; and Barrett, Donald C., 4,560,016, Cl. 177-210.00R.
Barrow, Michael, to Burroughs Corporation. Multilayered printed circuit board with controlled 100 ohm impedance. 4,560,962, Cl. 333-1.000.
Barry, Robert F.; Delzell, Susan C.; Wilson, John F.; and Nylund, Theodore W., to Westinghouse Electric Corp. Nuclear fuel assembly. 4,560,532, Cl. 376-434.000.
Bartch, Donald W.: *See—*
Deal, Samuel B.; and Bartch, Donald W., 4,560,581, Cl. 427-64.000.
Basevi, John L. Noise making balloon valve. 4,560,392, Cl. 446-186.000.
BASF Aktiengesellschaft: *See—*
Baumann, Hans; and Grychtol, Klaus, 4,560,744, Cl. 534-696.000.
Brunnmueller, Fritz; and Kroener, Michael, 4,560,756, Cl. 544-408.000.
Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, 4,560,624, Cl. 428-632.000.
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, 4,560,456, Cl. 204-159.140.
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fouquet, Gerd, 4,560,822, Cl. 585-606.000.
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.
Menig, Helmuth; Fischer, Martin; and Baer, Karl, 4,560,769, Cl. 548-560.000.
Naarmann, Herbert; Munch, Volker; and Penzien, Klaus, 4,560,593, Cl. 427-443.100.

Schmidts, Kurt; Feyh, Hans-Otto; and Mania, Max J., 4,560,114, Cl. 242-71.800.
Seybold, Guenther, 4,560,751, Cl. 544-60.000.
Weberndoerfer, Volkmar; Brunnmueller, Friedrich; Eisert, Manfred; and Bermes, Rudolf, 4,560,745, Cl. 534-728.000.

Basile, Peter A.: *See*—
Duncan, L. Scot; Groth, Hugh F.; and Basile, Peter A., 4,559,666, Cl. 15-353.000.

Basore, William T. Support for hi-fi turntable base. 4,560,136, Cl. 248-559.000.

Bast, Gordon B.; Metz, Carl W.; and Nicholas, John F. Mobile telephone mounting pedestal. 4,560,831, Cl. 179-2.00E.

Bastioli, Catia; Gianotti, Giuseppe; Mattera, Adriano; and Parrini, Paolo, to Montedison S.p.A. Process for preparing poly-piperazinamide anisotropic shaped articles. 4,560,522, Cl. 264-41.000.

Bata Shoe Company, Inc.: *See*—
Hamy, Norbert; Nutt, Phillip; and Sheridan, Douglas, 4,559,723, Cl. 36-102.000.

Batard, Denis; Freland, Jean-Claude; Wallez, Bernard; Desffains, J. Paul; and Valle, Roger, to S.A. Arlux. Orthopaedic lumbo-sacral corset with semi-rigid elements and inflatable pads. 4,559,933, Cl. 128-78.000.

Batick, Philip, Jr. Fishing rod and reel holder for handicapped persons. 4,559,735, Cl. 43-21.200.

Batla, Masroor A.: *See*—
Bond, Raymond G.; and Batla, Masroor A., 4,560,832, Cl. 179-2.0EA.

Battelle Memorial Institute: *See*—
Porta, Augusto; Schaub, Maurice; Ayerbe, Andre ; and Bunter, Guy, 4,560,455, Cl. 204-130.000.

Batzer, Thomas H.; and Call, Wayne R., to United States of America, Energy. Vacuum pump apparatus. 4,559,787, Cl. 62-55.500.

Batzold, John S.: *See*—
Hoffman, James E.; and Batzold, John S., 4,560,453, Cl. 204-106.000.

Bauer, Henry W., III; and Shukla, Ravindra S., to Coulter Electronics, Inc. Method and compositions for determination of gamma glutamyl transpeptidase. 4,560,650, Cl. 435-15.000.

Bauer, Karl: *See*—
Runkel, Walter; Lenk, Erich; and Bauer, Karl, 4,560,347, Cl. 432-59.000.

Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, to SWF Auto-Electric GmbH; and Daimler-Benz. Windshield wiper-arm assembly. 4,559,663, Cl. 15-250.350.

Baumann, Hans; and Grychtol, Klaus, to BASF Aktiengesellschaft. Azo dye 2:1-chromium complexes. 4,560,744, Cl. 534-696.000.

Baus, Heinz G. Ventilating unit. 4,560,320, Cl. 415-118.000.

Baxter, Martin G.; Elphick, Albert R.; Miller, Alistair A.; and Sawyer, David A. Substituted aromatic compounds. 4,560,687, Cl. 514-242.000.

Baxter Travenol Laboratories, Inc.: *See*—
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.

Bayer Aktiengesellschaft: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,560,726, Cl. 525-71.000.
Oeckl, Siegfried; Schmitt, Hans-Georg; and Brandes, Wilhelm, 4,560,694, Cl. 514-359.000.
Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, 4,560,738, Cl. 528-62.000.

Bayer, Bryce E., to Eastman Kodak Company. Image processing method based on processing of interrelated image gradients. 4,561,022, Cl. 358-167.000.

Bayer, Michael S., to Thermal-Barrier Products, Inc. Stabilized pivotable window. 4,559,739, Cl. 49-177.000.

Bayerische Motoren Werke AG: *See*—
Seidl, Josef, 4,560,185, Cl. 280-748.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Dorsch, Werner, 4,560,106, Cl. 236-91.00E.

BBC Brown, Boveri & Company Limited: *See*—
Furrer, Andreas, 4,560,944, Cl. 330-10.000.
Jenny, Ernst; and Zumstein, Bruno, 4,559,784, Cl. 60-606.000.

BDM Corporation, The: *See*—
Shaver, Michael O., 4,561,092, Cl. 370-89.000.

Beaver, Richard N.: *See*—
Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., 4,560,452, Cl. 204-98.000.

Becke, Hans W., to RCA Corporation. Ballasted, gate controlled semiconductor device. 4,561,008, Cl. 357-38.000.

Beckworth Davis International, Inc.: *See*—
Davis, Clint A.; and Trail, Melvin P., 4,561,059, Cl. 364-477.000.

Beddome, Robert A.; and Cheung, Harry, to Union Carbide Corporation. Air separation process to produce elevated pressure oxygen. 4,560,398, Cl. 62-29.000.

Bedell, John R.; Smith, Robert W.; and Liebermann, Howard H., to Allied Corporation. Continuous vacuum casting and extraction device. 4,559,992, Cl. 164-463.000.

Beebe, Randall. Carrying device for transporting a cylindrical tank. 4,560,193, Cl. 294-31.200.

Beecham Group p.l.c.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,560,552, Cl. 424-114.000.
Hadley, Michael S.; and Blaney, Francis E., 4,560,757, Cl. 546-112.000.
Osborne, Neal F., 4,560,550, Cl. 424-114.000.

Behrmann, Edgar A.: *See*—
Sherman, William E., II; and Behrmann, Edgar A., 4,560,368, Cl. 464-112.000.

Beimgraben, Herbert W., to Baker Oil Tools, Inc. Apparatus for directional drilling and the like of subterranean wells. 4,560,013, Cl. 175-73.000.

Belli, Aldo: *See*—
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,560,777, Cl. 549-374.000.

Ben Clements & Sons, Inc.: *See*—
Dilley, Gerald G., 4,559,977, Cl. 140-93.600.

Bender, Robert. Method of beneficiating coal. 4,560,390, Cl. 44-15.00R.

Bender, Roland, to United States of America, Navy. Electrical connector for sonobuoy launch system. 4,560,228, Cl. 339-147.00R.

Benmussa, Simon. Self-heating receptacle. 4,559,921, Cl. 126-263.000.

Benson, Arthur: *See*—
Levendusky, Thomas L.; and Benson, Arthur, 4,560,850, Cl. 219-10.55E.

Benton, Michael W. Battery post extension member. 4,560,229, Cl. 339-224.000.

Benz, Wilhelm: *See*—
Kraft, Wilfred; and Benz, Wilhelm, 4,560,441, Cl. 162-273.000.

Berco S.p.A.: *See*—
Bisi, Ugo, 4,560,174, Cl. 277-92.000.

Berg, Albert T., Jr.: *See*—
Langlie, Howard; and Berg, Albert T., Jr., 4,560,827, Cl. 174-52.00S.

Berger, Josef: *See*—
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.

Bergh, Ralph A.: *See*—
Shaw, Herbert J.; Bergh, Ralph A.; and Digonnet, Michel J. F., 4,560,234, Cl. 350-96.150.

Berglund, Lennart H. A., to Boliden Aktiebolag. Method for recovering useful products from waste products obtained when manufacturing aluminium fluoride. 4,560,540, Cl. 423-116.000.

Bergstrom, Arne. Objectives particularly for television cameras. 4,560,865, Cl. 250-213.0VT.

Bergstrom, Per-Olof: *See*—
Ahlen, Karl-Gustav; Bergstrom, Per-Olof; and Wallgren, Hans A., 4,559,849, Cl. 74-761.000.

Bermes, Rudolf: *See*—
Weberndoerfer, Volkmar; Brunnmueller, Friedrich; Eisert, Manfred; and Bermes, Rudolf, 4,560,745, Cl. 534-728.000.

Berner, Godwin; and Kirchmayr, Rudolf, to Ciba Geigy Corporation. Photopolymerizable mixtures and processes for the photopolymerization of cationically polymerizable compounds. 4,560,709, Cl. 204-159.140.

Berthel, Robert O.; Plank, Vernon G.; and LaGross, Dennis L., to United States of America, Air Force. Apparatus for continuously inspecting the physical characteristics of particulate matter. 4,561,018, Cl. 358-107.000.

Berthet, Pierre: *See*—
Gerard, Jean-Louis; Berthet, Pierre; Bricot, Claude; and Audoin, Michel, 4,561,082, Cl. 369-45.000.

Berti, Alfredo; Mussati, Werther; and Bruschi, Roberto, to Snamprogetti S.p.A. Thermally insulated pipe for the construction of underwater pipelines. 4,560,188, Cl. 285-47.000.

Beseme, Jean H.; Corral, Jose R.; and Glotin, Bernard J., to Schlumberger Technology Corporation. Apparatus for measuring the internal dimensions of a tube, notably in a well, and displacement measurement method applicable to such an apparatus. 4,559,709, Cl. 33-178.00F.

Betteravia Byproducts Co.: *See*—
Henderson, Charles J.; and Cotton, Gerald L., 4,560,561, Cl. 426-74.000.

Betz Laboratories, Inc.: *See*—
Hollander, Orin, 4,560,481, Cl. 210-697.000.

Beuhler, Allyson J.: *See*—
Polak, Anthony J.; and Beuhler, Allyson J., 4,560,444, Cl. 204-1.00T.

Bey, Philippe; and Jung, Michel, to Merrell Dow France et Cie. α-Halomethyl derivatives of α-amino acids. 4,560,795, Cl. 562-561.000.

Bez, Eckhard; and Farrant, John L., to Commonwealth Scientific and Industrial Research Organization. Porting and ducting arrangement. 4,560,327, Cl. 417-493.000.

Bianchi, Gianfranco; Borelli, Riccardo; and Pierpaoli, Piero, to Kent-Tieghi S.p.A. Differential pressure transmitter for industrial process fluids, provided with compensation of static pressure change effects. 4,559,829, Cl. 73-708.000.

Billet, Rene , to Valeo. Clutch cover assembly with retaining lugs for the pressure plate. 4,560,055, Cl. 192-109.00R.

Billman, Timothy B.; Coller, James R.; and Marpoe, Gary R., Jr., to AMP Incorporated. Socket for surface mount dip. 4,560,218, Cl. 339-17.0CF.

Binder, Michael: *See*—
Walker, Charles W., Jr.; Wade, William L., Jr.; Binder, Michael; and Gilman, Sol, 4,560,628, Cl. 429-105.000.

Birkadze, Dzhemal I.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov,

Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Birkenstock, Karl. Fastening straps and articles employing fastening straps. 4,559,678, Cl. 24-323.000.

Bisi, Ugo, to Berco S.p.A. Multi lip seal. 4,560,174, Cl. 277-92.000.

Bjorklund, James R.: *See*—
Garza, Richard G.; Sayegh, Pinhas; and Bjorklund, James R., 4,560,363, Cl. 446-342.000.

Black & Decker Inc.: *See*—
Grossmann, Horst; Herting, Rainer; and Kaiser, Horst, 4,559,857, Cl. 83-471.300.

Black, John W., to Pemco-Kalamazoo, Inc. Wheel braking mechanism for a wheel bracket assembly. 4,559,668, Cl. 16-35.00R.

Blacksberg, Richard: *See*—
Isaacs, Michael S.; and Blacksberg, Richard, 4,560,360, Cl. 446-222.000.

Blaney, Francis E.: *See*—
Hadley, Michael S.; and Blaney, Francis E., 4,560,757, Cl. 546-112.000.

Blaschim S.p.A.: *See*—
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,560,777, Cl. 549-374.000.

Blasing, Horst; and Kallweit, Manfred, to Schering Aktiengesellschaft. Apparatus for the galvanic deposition of metal. 4,560,460, C'. 204-224.00R.

Blaupunkt-Werke GmbH: *See*—
Glatzel, Werner, 4,559,978, Cl. 140-147.000.

Blokhuis, William: *See*—
Muir, Ron; and Blokhuis, William, 4,560,489, Cl. 252-33.400.

Blom, C. James, to Roxor Corporation. Segmented mirror. 4,560,256, Cl. 350-613.000.

Bloom, Phyllis R.; and Sherrard, Perry O. Pet dryer. 4,559,903, Cl. 119-19.000.

Blotenberg, Wilfried, to MAN Maschinenfabrik Unternehmensbereich GHH Sterkrade. Method and apparatus for controlling at least two parallel-connected turbocompressors. 4,560,319, Cl. 415-1.000.

Blouin, John J.: *See*—
Sherwin, Martin B.; and Blouin, John J., 4,560,653, Cl. 435-109.000.

Blytas, George C., to Shell Oil Company. Recovery of glycerine from saline waters. 4,560,812, Cl. 568-869.000.

BM Chemie Kunststoff GmbH: *See*—
Melchior, Bernd, 4,560,411, Cl. 106-90.000.

Bobsein, Rex L.; and Johnson, Marvin M., to Phillips Petroleum Company. Hydrogenation catalyst. 4,560,817, Cl. 585-273.000.

Bocharov, Jury A.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Bocker, Jurgen; Klein, Klaus W.; and Gersbach, Klaus, to Rheinmetall GmbH. Penetrator projectiles. 4,559,876, Cl. 102-520.000.

Bode, Gunter; Meier, Horst; and Engler, Manfred. Device for pressing down product in filled containers with open tops which can be moved continuously and with predetermined spacing. 4,559,763, Cl. 53-527.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Prins reaction products of diisoamylene, derivatives thereof, organoleptic uses thereof and processes for preparing same. 4,560,776, Cl. 549-356.000.

Bodine, Albert G. Modification of diesel engine precombustion chamber to attenuate detonation and improve combustion. 4,559,911, Cl. 123-271.000.

Boeck, LaVerne D.: *See*—
Johnson, Ronald D.; Kastner, Ralph E.; and Boeck, LaVerne D., 4,560,509, Cl. 260-239.30P.

Boeing Company, The: *See*—
Frank, Ed, 4,560,433, Cl. 156-459.000.
Sealey, Francis; and Weiland, Richard H., 4,560,123, Cl. 244-129.500.

Bohan, John E., Jr., to Honeywell Inc. Functional check for a hot surface ignitor element. 4,560,343, Cl. 431-66.000.

Bohme, Eike; and Rubenzer, Peter, to Prolic AG. Automatic washing- and rinsing device for titration plates or the like. 4,559,664, Cl. 15-302.000.

Boik, Elmer J., to Continental White Cap, Inc. Tamper indicating band for use in low rise cam-off application. 4,560,076, Cl. 215-252.000.

Bok, Edward. Method for applying a coating on a substrate. 4,560,590, Cl. 427-294.000.

Bolenbaugh, Daniel L.; Wegh, John R.; and Smith, Roger L., to Allied Corporation. Disc brake assembly spring. 4,560,039, Cl. 188-73.450.

Boles, John A.: *See*—
Eastman, Jay M.; and Boles, John A., 4,560,862, Cl. 235-467.000.

Boliden Aktiebolag: *See*—
Berglund, Lennart H. A., 4,560,540, Cl. 423-116.000.

Bond, Morris M.: *See*—
Coleman, Darrel F.; and Bond, Morris M., 4,559,836, Cl. 73-861.660.

Bond, Raymond G.; and Batla, Masroor A., to T.A.D. Avanti, Inc. Telephone system. 4,560,832, Cl. 179-2.0EA.

Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, to SKF Kugellagerfabriken GmbH. Cage for ball bearings, especially for inclined ball bearings. 4,560,291, Cl. 384-533.000.

Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,560,627, Cl. 429-103.000.

Bonse, Gerhard: *See*—
Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, 4,560,738, Cl. 528-62.000.

Bonzer, Richard C.; and Greene, Frederick C., to Darnell Corporation, Ltd. Shock resistant caster having pressure plates and centering projections. 4,559,669, Cl. 16-44.000.

Borelli, Riccardo: *See*—
Bianchi, Gianfranco; Borelli, Riccardo; and Pierpaoli, Piero, 4,559,829, Cl. 73-708.000.

Bosch, Hubert, to Schertler, Siegfried. Vacuum gate valve. 4,560,141, Cl. 251-167.000.

Bosma, Marcel A. R.: *See*—
van der Stoel, Roland E.; Bosma, Marcel A. R.; Janssen, Petrus H. J.; and van de Moesdijk, Cornelis G. M., 4,560,760, Cl. 546-243.000.

Bossard, Alfred E.; and Kuster, Kaspar, to Ciba Geigy Corporation. Coating apparatus. 4,559,896, Cl. 118-300.000.

Bott, Ernst W.: *See*—
Wucherpfennig, Karl; Bott, Ernst W.; and Schottler, Peter, 4,560,565, Cl. 426-330.400.

Bottenbruch, Ludwig: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,560,726, Cl. 525-71.000.

Bouchard, Andre C.; and Grossman, Mark W., to GTE Products Corporation. Method for sealing arc discharge lamps. 4,560,357, Cl. 445-26.000.

Bouchee, Bernhard, to Hoechst Aktiengesellschaft. Sample collector. 4,560,535, Cl. 422-102.000.

Bourassa, Ronald R.; and Butler, Douglas B., to Inmos Corporation. Method of making polysilicon resistors with a low thermal activation energy. 4,560,419, Cl. 148-1.500.

Bourgonje, Wouter, to U.S. Philips Corporation. Power supply arrangement for applying direct current to subscriber circuits. 4,560,835, Cl. 179-16.0AA.

Bowdren, Brian L., to Bowdren, Inc. Low profile strap type turnbuckle with load bearing articulated nut. 4,560,147, Cl. 254-231.000.

Bowdren, Inc.: *See*—
Bowdren, Brian L., 4,560,147, Cl. 254-231.000.

Bowers, William J., to C. R. Bard, Inc. Electrosurgical generator. 4,559,943, Cl. 128-303.140.

Bowman, Ronald R.; and Sodal, Ingvar E., to Marquest Medical Products, Inc. Actuator for control valves and related systems. 4,560,871, Cl. 250-288.000.

Boyer, Carl W.: *See*—
Kim, Tai K.; Munn, Robin W.; Boyer, Carl W.; and Vogt, Martin C., 4,560,539, Cl. 423-59.000.

Boyes, David H.: *See*—
Young, David E.; and Boyes, David H., 4,559,935, Cl. 128-88.000.

Boyle, Stephen A.: *See*—
Cooney, James S.; and Boyle, Stephen A., 4,560,223, Cl. 339-95.00R.

Bozio, Robert P., to American Standard Inc. Fail-safe square-wave oscillator. 4,560,953, Cl. 331-108.00D.

Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, to Wacker-Chemie GmbH. Aqueous polymer dispersions preparation. 4,560,724, Cl. 524-734.000.

Bradley, John S., to Gassett, John D., a part interest. Fluid waste disposal. 4,560,503, Cl. 252-633.000.

Bradshaw, Cyril E., to Eaton Corporation. Single coil vacuum/vent valve. 4,559,971, Cl. 137-596.170.

Brand, Rolf. Lightweight aircraft. 4,560,119, Cl. 244-13.000.

Brandenstein, Manfred; Haas, Roland; and Hartmann, Hein, to SKF Kugellagerfabriken GmbH. Hydraulically actuated clutch throw-out. 4,560,051, Cl. 192-98.000.

Brandenstein, Manfred: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Brandes, Wilhelm: *See*—
Oeckl, Siegfried; Schmitt, Hans-Georg; and Brandes, Wilhelm, 4,560,694, Cl. 514-359.000.
Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, 4,560,738, Cl. 528-62.000.

Brands ter, Helge; Ommundsen, Tor A.; and Mjoen, Oyvind, to Geophysical Company of Norway A.S. System for sorting seismic data in marine surveys. 4,561,073, Cl. 367-19.000.

Branson Ultrasonics Corporation: *See*—
Flood, Gary N., 4,560,427, Cl. 156-73.300.

Braun, Ernst; and Braun, Gert, to Halbach and Braun Industrieanlagen. Conveyor trough construction. 4,560,059, Cl. 198-735.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,560,059, Cl. 198-735.000.

Breidohr, Hans-Gunther: *See*—
Stoldt, August; Stemig, Heinz; Breidohr, Hans-Gunther; and Martin, Manfred, 4,559,884, Cl. 112-262.100.
Brekelmans, Henricus J. P. M., to IHC Holland N.V. System and device for detecting the forming of depot. 4,559,813, Cl. 73-61.400.
Brennan, Edward J., to PTC Aerospace Inc. Dish for use with meal tray feeding system which uses heater shelves to lift dishes. 4,560,859, Cl. 219-386.000.
Brenner, Paul, to Eckardt AG. Crossed-bellows controller. 4,559,866, Cl. 92-39.000.
Breton S.p.A.: *See*—
Toncelli, Marcello; and Cado', Walter, 4,559,920, Cl. 125-17.000.
Brevex Georges Claude S.A.: *See*—
Droz, Francois, 4,560,133, Cl. 248-442.000.
Bricot, Claude: *See*—
Gerard, Jean-Louis; Berthet, Pierre; Bricot, Claude; and Audoin, Michel, 4,561,082, Cl. 369-45.000.
Bridgestone Tire Co., Ltd.: *See*—
Narumiya, Tsuneaki, 4,560,478, Cl. 210-496.000.
Briggs, Jonathan, to Syntex (U.S.A.) Inc. Method and apparatus for enhanced detection of electromagnetic signals. 4,560,881, Cl. 250-458.100.
Brinkley, Robert W., to Minnesota Mining and Manufacturing Company. Blends of fluorochemicals and fibrous substrates treated therewith. 4,560,487, Cl. 252-8.750.
British Aerospace Public Limited Company: *See*—
Parkinson, Colin C. A.; and Kinnerly, Anthony G., 4,560,122, Cl. 244-54.000.
British Gas Corp.: *See*—
Eales, David F., 4,560,094, Cl. 222-195.000.
Hayward, Ian, 4,560,928, Cl. 324-172.000.
British Telecommunications: *See*—
Cotter, David, 4,560,246, Cl. 350-96.160.
McKeown, James H. A., 4,561,067, Cl. 364-819.000.
British Telecommunications plc: *See*—
Gosling, Ian G.; and Carver, Richard D., 4,560,965, Cl. 333-219.000.
Britt, Paul E. Housing for evaporative cooler control device. 4,560,972, Cl. 337-338.000.
Brockway, Bert R.; and Arnold, Stephen R. Controlled air bleed cigarette holder. 4,559,955, Cl. 131-198.200.
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, to ASEA Aktiebolag. Fiber optical luminescence sensor for measuring mechanical displacement. 4,560,868, Cl. 250-227.000.
Brogren, Erik E.; and Chakrabarti, Subrata K., to Chicago Bridge & Iron Company. Hydrodynamic test apparatus with offshore structure model using gas bag seal at model bottom. 4,559,817, Cl. 73-148.000.
Bron, Alphonse: *See*—
Mock, Elmar; and Bron, Alphonse, 4,561,077, Cl. 368-282.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,844, Cl. 200-5.00A.
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,845, Cl. 200-5.00A.
Brown, Alec T., to Mechanical Technology Incorporated. Displacer for Stirling engine. 4,559,779, Cl. 60-517.000.
Brown, Boveri & Cie Aktiengesellschaft: *See*—
Jurgens, Heinz, 4,559,854, Cl. 83-170.000.
Brown, Karen H.; Moore, David F.; and van der Hoeven, Bernard J. C., Jr., to International Business Machines Corporation. Composite back-etch/lift-off stencil for proximity effect minimization. 4,560,435, Cl. 156-643.000.
Brown, Omar L., to Dayton Reliable Tool & Mfg. Co. Preheat start-up arrangement for stamping and forming presses. 4,559,800, Cl. 72-342.000.
Bruckner Trockentechnik GmbH & Co.: *See*—
Gresens, Harry, 4,559,680, Cl. 26-74.000.
Brueske, Ralph H., to Butler Manufacturing Company. Method of installing a prefabricated curb unit to a standing seam roof. 4,559,753, Cl. 52-748.000.
Bruggen, Gerhard; Karr, Dieter; and Rottler, Wolfgang. Non-contacting distance measuring system. 4,561,064, Cl. 364-561.000.
Brunnmueller, Friedrich: *See*—
Weberndoerfer, Volkmar; Brunnmueller, Friedrich; Eisert, Manfred; and Bermes, Rudolf, 4,560,745, Cl. 534-728.000.
Brunnmueller, Fritz; and Kroener, Michael, to BASF Aktiengesellschaft. 2-Aminopyrazines and the preparation of 2-aminopyrazines and pyrazines. 4,560,756, Cl. 544-408.000.
Bruno, David J., Jr.; Dodds, Michael J.; Fuqua, Debra L.; and Hunter, John E., to Procter & Gamble Company, The. Textured protein tomato sauce products. 4,560,564, Cl. 426-250.000.
Brunswick Corporation: *See*—
McCormick, Daniel F., 4,560,355, Cl. 440-86.000.
Bruschi, Roberto: *See*—
Berti, Alfredo; Mussati, Werther; and Bruschi, Roberto, 4,560,188, Cl. 285-47.000.
Bruttel, Beat; Schneider, Hansjorg; and Dorfel, Werner H., to Ciba Geigy Corporation. Process for producing granulates of water-soluble dyes by fluidized bed granulation. 4,560,747, Cl. 534-887.000.
Bryant, Marga M.: *See*—
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,560,375, Cl. 604-9.000.
BSP International Foundations Limited: *See*—
Storey, Robert B., 4,559,863, Cl. 91-165.000.
Bucher, George D.: *See*—
Miller, Richard A.; and Bucher, George D., 4,560,856, Cl. 219-121.0LC.
Buckley, Francis D.: *See*—
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.
Budrean, John D.; and Kirkpatrick, John A., to Verson Allsteel Press Company. Method for drawing heavy wall shells. 4,559,802, Cl. 72-349.000.
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, to Buhler, Eugen; and Hutschenreuther AG. Apparatus for producing dry-pressed moulding from a particulate or granular moulding material. 4,560,336, Cl. 425-78.000.
Bukala, Alexander E., to Littelfuse, Inc. Fuseholder for blade-type fuses. 4,560,227, Cl. 339-147.00R.
Bukhman, Yefim; and Thornquist, Steven C., to Motorola, Inc. Process for etching tapered polyimide vias. 4,560,436, Cl. 156-643.000.
Bull, Cyril A., to Metal Box p.l.c. Containers. 4,560,313, Cl. 413-1.000.
Bunter, Guy: *See*—
Porta, Augusto; Schaub, Maurice; Ayerbe, Andre ; and Bunter, Guy, 4,560,455, Cl. 204-130.000.
Burda, Dan S., to MAC Corporation of America. Current draw-actuated hydraulic drive arrangement for rotary shredder. 4,560,110, Cl. 241-36.000.
Burkhardt, Wolfgang: *See*—
Wehner, Hans-Joachim; and Burkhardt, Wolfgang, 4,561,042, Cl. 362-30.000.
Burlage, Brian J.; Wiklund, David E.; and Lenz, Gary A., to Fisher Controls Company, Inc. Piezoelectric pressure frequency sensor. 4,559,832, Cl. 73-861.240.
Burnett, Patricia A., to Panett Corporation. Urine specimen collection system. 4,559,649, Cl. 4-144.100.
Burns, Carmen; and Grabbe, Dimitry, to AMP Incorporated. Hermetically sealed chip carrier. 4,560,826, Cl. 174-52.0FP.
Burns, Richard J.; Willeboordse, Friso G.; and Cohen, Martin F., to Union Carbide Corporation. Fountain solutions suitable for use in lithographic offset printing. 4,560,410, Cl. 106-2.000.
Burr-Brown Corporation: *See*—
Wolfson, Sumner H., 4,560,084, Cl. 220-359.000.
Burr, J. Kelsey, to Halkey-Roberts Corporation. Personal flotation device. 4,560,356, Cl. 441-80.000.
Burrell, Alfred A. System for labelling storage drawers. 4,559,730, Cl. 40-324.000.
Burrell, Alfred A. Display and storage rack. 4,560,072, Cl. 211-75.000.
Burrington, James D.; Grasselli, Robert K.; Pesa, Fred; and Maher, Elizabeth A., to Standard Oil Company, The. Process for making dimerization catalysts. 4,560,730, Cl. 525-340.000.
Burroughs Corporation: *See*—
Barrow, Michael, 4,560,962, Cl. 333-1.000.
Eddleston, Michael J.; and Hume, Christopher, 4,560,079, Cl. 220-4.00R.
Niven, Jeffrey E.; and Hsieh, Der-Chang, 4,560,925, Cl. 324-97.000.
Burt, Edward A.: *See*—
Goins, Dixie E.; Huggins, Harold V.; Burt, Edward A.; and Holmes, Silas W., 4,560,809, Cl. 568-789.000.
Burton, Philip J., to Charles Winn (Valves) Limited. Butterfly and ball valves. 4,560,142, Cl. 251-306.000.
Burton, Thomas M.; and Kucharska, Helena Z., to Fiberglas Canada Inc. Method of producing polyester foams using borohydride dispersions. 4,560,706, Cl. 521-85.000.
Busse, Charles E.: *See*—
Cress, Allan K.; and Busse, Charles E., 4,559,765, Cl. 53-557.000.
Butler, Barry L. Centerless-drive solar collector system. 4,559,926, Cl. 126-438.000.
Butler, Douglas B.: *See*—
Bourassa, Ronald R.; and Butler, Douglas B., 4,560,419, Cl. 148-1.500.
Butler Manufacturing Company: *See*—
Brueske, Ralph H., 4,559,753, Cl. 52-748.000.
McClure, Richard R., 4,559,805, Cl. 72-384.000.
Buzynski, John E.: *See*—
Strecker, William D.; Buzynski, John E.; and Thompson, David, 4,560,985, Cl. 340-825.500.
Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Rainer, Georg, 4,560,693, Cl. 514-338.000.
Byler, Richard E.: *See*—
McCarthy, James P.; and Byler, Richard E., 4,560,047, Cl. 192-52.000.
Bzowski, Christopher: *See*—
Crupi, Franco A.; Bzowski, Christopher; and Measures, Ernest R., 4,559,922, Cl. 126-271.20A.
C. Nicolai GmbH & Co. KG: *See*—
Philipp, Alexander, 4,559,934, Cl. 128-80.00E.
C. R. Bard, Inc.: *See*—
Bowers, William J., 4,559,943, Cl. 128-303.140.
C.S.E. Automation Engineering Services, Inc.: *See*—
Taylor, Donald K.; Rogers, William; McGary, Vernon; and Lenart, Peter, 4,559,970, Cl. 137-557.000.
Cabot, Richard C., to Tektronix, Inc. Method and circuit for phase lock loop initialization. 4,560,950, Cl. 331-1.00A.
Cabot, Richard C., to Tektronix, Inc. Oscillator fine tune circuit. 4,560,957, Cl. 331-135.000.
Cado', Walter: *See*—
Toncelli, Marcello; and Cado', Walter, 4,559,920, Cl. 125-17.000.

Caffarelli, Elvio: *See—*
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,560,546, Cl. 423-607.000.

Cairo, John A., Jr.: *See—*
Warning, Theodore J.; and Cairo, John A., Jr., 4,560,483, Cl. 210-777.000.

California Institute of Technology: *See—*
Goetz, Alexander F. H., 4,560,275, Cl. 356-326.000.

Call, Wayne R.: *See—*
Batzer, Thomas H.; and Call, Wayne R., 4,559,787, Cl. 62-55.500.

Callen, Patrick J., to RCA Corporation. High-efficiency, low-voltage-drop series regulator using as its pass element an enhancement-mode FET with boosted gate voltage. 4,560,918, Cl. 323-273.000.

Canada, Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources: *See—*
Mitchell, Crighton M., 4,561,062, Cl. 364-555.000.

Canevari, Gerard P., to Exxon Research and Engineering Co. Chemical dispersant for viscous oils. 4,560,482, Cl. 210-749.000.

Cannon, Joseph P. Anal medication applicator. 4,560,376, Cl. 604-54.000.

Canon Kabushiki Kaisha: *See—*
Hashimoto, Teiji, 4,560,265, Cl. 354-246.000.
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.
Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, 4,560,263, Cl. 354-195.100.
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, 4,560,864, Cl. 250-201.000.
Maeda, Masaya, 4,561,029, Cl. 360-85.000.
Matsumoto, Kazuya; and Endo, Kiyonobu, 4,561,032, Cl. 360-114.000.
Matsumura, Susumu; Suzuki, Takashi; and Suzuki, Kenji, 4,560,863, Cl. 250-201.000.
Namai, Akihiro; and Suzuki, Ryoichi, 4,560,266, Cl. 354-400.000.
Sato, Yuichi; Sakurada, Nobuaki; Kawamura, Hideaki; and Watanabe, Yoshitaka, 4,560,997, Cl. 346-140.00R.
Sekimura, Nobuyuki, 4,560,240, Cl. 350-336.000.
Tamura, Yasuyuki, 4,561,024, Cl. 358-287.000.
Tokuhara, Mitsuhiro; and Yamada, Yu, 4,560,242, Cl. 350-425.000.
Tokuhara, Mitsuhiro, 4,560,999, Cl. 346-160.000.

Cantu, Paul. Wheeled toy with wheel-driven decorative means. 4,560,361, Cl. 446-231.000.

Capehart, Tenneille W.: *See—*
Sell, Jeffrey A.; Capehart, Tenneille W.; and Richter, Roy, 4,560,042, Cl. 188-322.210.

Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, to Pierrel S.p.A. *Streptomyces antibioticus* ATCC 31771 and process for obtaining same. 4,560,662, Cl. 435-253.000.

Card, Joseph L.: *See—*
Card, Roy T.; and Card, Joseph L., 4,559,885, Cl. 112-266.200.

Card, Roy T.; and Card, Joseph L. Apparatus and process for producing a chain stitched tufted product. 4,559,885, Cl. 112-266.200.

Cardiac Pacemakers, Inc.: *See—*
Dahl, Roger W.; and Mayer, David W., 4,559,951, Cl. 128-642.000.

Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, to Zambon S.p.A. Analgesic, antipyretic or anti-inflammatory imidazole compounds. 4,560,696, Cl. 514-397.000.

Caretaker Systems, Inc.: *See—*
Mathews, Lester R., 4,559,653, Cl. 4-541.000.

Carl Kurt Walther GmbH & Co. KG: *See—*
Tolle, Hans; Frech, Karl; and Ludke, Hartmut, 4,560,586, Cl. 427-134.000.

Carl-Zeiss-Stiftung: *See—*
Enderle, Eckhard; and Kaufmann, Dieter, 4,560,213, Cl. 308-5.00R.

Carlson, Emery J.: *See—*
Yamanis, Jean; Carlson, Emery J.; and Armor, John N., 4,560,797, Cl. 564-267.000.

Carpenter, Larry: *See—*
Andrews, Winston A.; and Carpenter, Larry, 4,559,671, Cl. 16-111.00R.

Carpenter, Scott R.: *See—*
Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., 4,559,661, Cl. 15-93.00R.

Carre, Jean-Jacques; and Pressaco, Pierre, to Societe Anonyme D.B.A. Braking corrector responsive to deceleration. 4,560,209, Cl. 303-22.00R.

Carruthers, John, to National Research Development Corp. Root crop harvester. 4,560,008, Cl. 171-14.000.

Cars & Concepts, Inc.: *See—*
Draper, David L., 4,560,602, Cl. 428-79.000.

Carson, Robert A.; Fenton, Francis M.; and Jones, David F., to AT&T Information Systems Inc. Call transfer method and circuitry. 4,560,837, Cl. 179-18.0BD.

Carter, David C. M.: *See—*
Applegate, Barry G.; Carter, David C. M.; and Heybourn, Frank, 4,560,057, Cl. 198-347.000.

Carter, Richard L., Sr. Motorcycle convertible top. 4,560,196, Cl. 296-102.000.

Carver, Richard D.: *See—*
Gosling, Ian G.; and Carver, Richard D., 4,560,965, Cl. 333-219.000.

Cascallana, Raul S. Amphibious vehicle. 4,559,892, Cl. 114-270.000.

Case, Edward M.; and Hopper, Chester S., to Marlo Company Incorporated, The. Packing material. 4,559,862, Cl. 87-1.000.

Caspersen, Leif D.; Felsvang, Karsten S.; and Schwartzbach, Christian, to A/S Niro Atomizer. Process for desulfurization of hot waste gas. 4,560,543, Cl. 423-242.000.

Cassia, Antonio M., to Steiner Company, Inc. Type of dispenser in particular for liquid soap. 4,560,093, Cl. 222-181.000.

Caterpillar Tractor Co.: *See—*
Chambers, Robert O., 4,559,841, Cl. 74-191.000.
Eftefield, Larry G.; Simmons, Gerald P.; and Stone, Gregory L., 4,560,207, Cl. 299-10.000.
Palmer, Marvin K., 4,560,148, Cl. 254-323.000.
Satzler, Ronald L., 4,560,018, Cl. 180-9.100.
Windish, Willis E.; and Schneider, Marvin L., 4,560,034, Cl. 188-72.300.

Cavalli, Alfredo. Electric household appliance for cutting fruit, vegetables and similar food products into small sticks or chunks of variable thickness. 4,560,111, Cl. 241-92.000.

Celanese Corporation: *See—*
Davenport, Kenneth G.; and Hilton, Charles B., 4,560,789, Cl. 560-142.000.
Gajria, Chandrasen; and Ozari, Yehuda, 4,560,714, Cl. 523-409.000.

Central Glass Company, Limited: *See—*
Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, 4,560,737, Cl. 527-72.000.

Centralab, Inc.: *See—*
Gagas, Donald F., 4,559,703, Cl. 29-876.000.

Centre d'Etudes du Fraisage: *See—*
Sachot, Michel, 4,559,682, Cl. 29-26.00A.

Centre National de la Recherche Scientifique: *See—*
Lucas, Jacques; and Fonteneau, Gilles, 4,560,667, Cl. 501-40.000.

Centre Technique du Bois et de L'Ambeublement: *See—*
Fondronnier, Jacques; Guillerm, Jean; and Comte, Michel, 4,559,987, Cl. 144-213.000.

Cerny, David E., to Respiratory Care, Inc. Self-contained nebulizer and system. 4,560,519, Cl. 261-78.00A.

Cerqueira, Francisco L. Faeces collection and concentration receiver. 4,559,837, Cl. 73-863.230.

Chakrabarti, Subrata K.: *See—*
Brogren, Erik E.; and Chakrabarti, Subrata K., 4,559,817, Cl. 73-148.000.

Chambers, Robert O., to Caterpillar Tractor Co. Gear train having an internal gear mechanism. 4,559,841, Cl. 74-191.000.

Champlin, Keith S.; and Kar, Pradip C., to FMC Corporation. Communication system bypass architecture. 4,561,088, Cl. 370-16.000.

Chanrion, Jean C., to Thomson CSF. Digital frequency synthesizer for generating a frequency-modulated signal and radio frequency apparatus including such a device. 4,560,960, Cl. 331-178.000.

Chapelot, Raymond, to Precision Mecanique Labinal. Waterproof electrical connector. 4,560,219, Cl. 339-60.00R.

Charles Winn (Valves) Limited: *See—*
Burton, Philip J., 4,560,142, Cl. 251-306.000.

Check Technology Corporation: *See—*
McCumber, Roger D.; Peterson, Thomas L.; and Lee, Gerry A., 4,560,293, Cl. 400-61.000.

Chen, Hwang C. Continuous type of fluid mixing and feeding device. 4,560,284, Cl. 366-336.000.

Cheung, Harry, to Union Carbide Corporation. Process to produce ultrahigh purity oxygen. 4,560,397, Cl. 62-28.000.

Cheung, Harry: *See—*
Beddome, Robert A.; and Cheung, Harry, 4,560,398, Cl. 62-29.000.

Chevron Research Company: *See—*
Demaison, Gerard J.; and Kaplan, Isaac R., 4,560,664, Cl. 436-29.000.
Field, Leslie A., 4,560,820, Cl. 585-489.000.
Foller, Peter C., 4,560,443, Cl. 204-283.000.
Nicksic, Stephen W.; and Starke, George W., 4,560,663, Cl. 436-25.000.
Yu, S. Gary; and Reynolds, John G., 4,560,465, Cl. 208-59.000.

Chiang, Alan W., to Mobil Oil Company. Polypropylene compositions containing bimodal calcium carbonate and a polysiloxane. 4,560,712, Cl. 523-220.000.

Chiarino, Dario: *See—*
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, 4,560,696, Cl. 514-397.000.

Chicago Bridge & Iron Company: *See—*
Brogren, Erik E.; and Chakrabarti, Subrata K., 4,559,817, Cl. 73-148.000.
Cutler, Donald R., 4,559,997, Cl. 165-94.000.

Chicago Rawhide Mfg. Co.: *See—*
Riley, William M., Jr., 4,560,177, Cl. 277-134.000.

Chin, Albert K., to Fogarty, Thomas J. Endarterectomy apparatus and process. 4,559,927, Cl. 128-1.00R.

Chin, Joseph T., to DCA Food Industries, Inc. High-speed food product forming apparatus. 4,560,337, Cl. 425-288.000.

Chisso Corporation: *See—*
Fujishita, Kusuo; and Sakamoto, Hideshi, 4,560,734, Cl. 526-142.000.

Chitayat, Anwar, to Anorad Corporation. Positioning table and linear motor. 4,560,911, Cl. 318-135.000.

Chiu, Norman H., to General Electric Company. Capacitive touch switch arrangement. 4,561,002, Cl. 340-365.00C.

Choh, Masamichi: *See—*
Sakamoto, Takashi; Sano, Tetsuo; Kodama, Eiji; and Choh, Masamichi, 4,561,061, Cl. 364-550.000.

Chorvat, Robert J.: *See—*
Adelstein, Gilbert W.; and Chorvat, Robert J., 4,560,754, Cl. 544-282.000.

Christenson, Roger M.; Valko, Joseph T.; Plasynski, Joseph E.; and Scriven, Roger L., to PPG Industries, Inc. Cationic electrodepositable compositions containing formaldehyde scavenger. 4,560,717, Cl. 523-456.000.

Christopher, Glenn B.: *See—*
Regalbuto, John A.; and Christopher, Glenn B., 4,559,890, Cl. 114-230.000.

Chu, Chin-Chiun, to Mobil Oil Corporation. Process for the oxidative dehydrogenation of ethyltoluene to methylstyrene. 4,560,818, Cl. 585-443.000.

Chu, Chin-Chiun, to Mobil Oil Corporation. Process for para-ethyltoluene dehydrogenation. 4,560,819, Cl. 585-445.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Ciba-Geigy AG: *See—*
Inculet, Ion, 4,560,107, Cl. 239-3.000.
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.

Ciba Geigy Corporation: *See—*
Berner, Godwin; and Kirchmayr, Rudolf, 4,560,709, Cl. 204-159.140.
Bossard, Alfred E.; and Kuster, Kaspar, 4,559,896, Cl. 118-300.000.
Bruttel, Beat; Schneider, Hansjorg; and Dorfel, Werner H., 4,560,747, Cl. 534-887.000.
Defago, Raymond; and Guz, Sabahattin, 4,560,387, Cl. 8-527.000.
Finter, Jurgen; and Fischer, Walter, 4,560,643, Cl. 430-346.000.
Fory, Werner, 4,560,771, Cl. 549-15.000.
Gehret, Jean-Claude; and Gubler, Kurt, 4,560,770, Cl. 548-561.000.
Hoegerle, Karl; and Tobler, Hans, 4,560,402, Cl. 71-092.000.
Lacroix, Roger; and Marfurt, Hans-Rudolf, 4,560,480, Cl. 210-638.000.
Rohrer, Rudolf, 4,560,388, Cl. 8-543.000.
Singer, John J., 4,560,516, Cl. 260-465.50A.
Spivack, John D.; and Pastor, Stephen D., 4,560,799, Cl. 568-47.000.
Yokoyama, Naokata, 4,560,689, Cl. 514-250.000.
Zahir, Abdul-Cader, 4,560,739, Cl. 528-99.000.

Cincinnati Milacron Inc.: *See—*
Wood, David B., III, 4,560,289, Cl. 384-99.000.

Cinzori, Robert J.; and Kern, Mark T., to Santa Barbara Research Center. Reference channel for sensing optical contamination. 4,560,874, Cl. 250-339.000.

Citizen Watch Co., Ltd.: *See—*
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, 4,561,044, Cl. 362-84.000.

City of Albany, Georgia: *See—*
Lanier, William D., 4,559,960, Cl. 134-166.00C.

Claassens, Jacobus M. M.: *See—*
Sneijers, Andreas P. E.; Claassens, Jacobus M. M.; and Van den Plas, Roger J. Q., 4,560,903, Cl. 313-625.000.

Clark, Harold: *See—*
Mason, Edgar G.; Clark, Harold; and Forsythe, James A., 4,559,902, Cl. 119-2.000.

Clarke, Roland N.: *See—*
Hatton, John S.; Clarke, Roland N.; and Saini, Raj K., 4,561,038, Cl. 361-280.000.

Clarke, Ronald A. W. Color varying reflector. 4,560,236, Cl. 350-102.000.

Clayton, Richard W., to RCA Corporation. Tilting apparatus for a viewfinder of a camera. 4,560,129, Cl. 248-278.000.

Cleary, Michael T.; and Laughlin, William C., to UOP Inc. Adsorbent for separating fatty acids from rosin acids. 4,560,675, Cl. 502-407.000.

Clements Industries, Inc.: *See—*
Matsushita, Hidekatsu, 4,559,766, Cl. 53-586.000.

Clextral: *See—*
Durieux, Francois P., 4,560,324, Cl. 417-383.000.

Clipfell, Perry E.· *See—*
Krummacher, Martin W.; Harmon, Lavon A.; and Clipfell, Perry E., 4,559,870, Cl. 100-215.000.

Cobbs, Walter H., Jr., to Nordson Corporation. Method for forming adhesive bond and a liquid crystal adhesive. 4,560,594, Cl. 428-1.000.

Cobiski, John F. Thoracic bench. 4,559,930, Cl. 128-70.000.

Coca-Cola Company, The: *See—*
Koblasz, Arthur; Hollister, James; and Alexander, Douglas, 4,559,979, Cl. 141-9.000.

Cochran, Stephen C.; and Terwoerds, Francis J., to Dana Corporation. System for shifting a vehicle to two or four-wheel drive. 4,559,846, Cl. 74-665.0GA.

Coden, Michael H.: *See—*
Scholl, Frederick W.; and Coden, Michael H., 4,561,091, Cl. 370-85.000.

Codenoll Technology Corporation: *See—*
Scholl, Frederick W., 4,560,984, Cl. 340-825.500.
Scholl, Frederick W.; and Coden, Michael H., 4,561,091, Cl. 370-85.000.

Codex Corporation: *See—*
Finn, Steven G., 4,560,976, Cl. 340-347.0DD.

Coenen, Hubert; Eggers, Rudolf; and Hagen, Rainer, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Process for the recovery of lecithin. 4,560,513, Cl. 260-403.000.

Coetzer, Johan: *See—*
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,560,627, Cl. 429-103.000.

Cohen, Edwin E., to Hughes Helicopters, Inc. Fail-safe improvement for a flexible shaft coupling. 4,560,364, Cl. 464-30.000.

Cohen, Martin F.: *See—*
Burns, Richard J.; Willeboordse, Friso G.; and Cohen, Martin F., 4,560,410, Cl. 106-2.000.

Colburn, Richard P., to United States of America, Energy. Fuel washout detection system. 4,560,529, Cl. 376-251.000.

Colby, Donald B., to Lee L. Woodard, Inc. Foldable table suited to outdoor use as well as to interior use. 4,559,878, Cl. 108-132.000.

Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group p.l.c. Antibiotics. 4,560,552, Cl. 424-114.000.

Coleman, Darrel F.; and Bond, Morris M., to Dieterich Standard Corp. Pitot type flow measuring device and method of mounting. 4,559,836, Cl. 73-861.660.

Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., to Hughes Aircraft Company. Real-time ordinal-value filter utilizing reference-function comparison. 4,560,974, Cl. 340-146.200.

Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., to Monsanto Company. Production of lactone in molten salt electrolysis. 4,560,775, Cl. 549-326.000.

Coller, James R.: *See—*
Billman, Timothy B.; Coller, James R.; and Marpoe, Gary R., Jr., 4,560,218, Cl. 339-17.0CF.

Collier, Joseph A., to Union Carbide Corporation. Processes for the production of alkylene glycol in the presence of organometalate. 4,560,813, Cl. 568-872.000.

Collin, Claude: *See—*
Pinsard, Herve ; Collin, Claude; and Faydit, Joel, 4,561,101, Cl. 375-108.000.

Commissariat a l'Energie Atomique: *See—*
Zava, Francis; and Coppa, Louis, 4,559,820, Cl. 73-161.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Antonovsky, Ariel D., 4,560,872, Cl. 250-310.000.
Bez, Eckhard; and Farrant, John L., 4,560,327, Cl. 417-493.000.

Communication Intelligence Corporation: *See—*
Crane, Hewitt D.; and Ostrem, John S., 4,561,105, Cl. 382-13.000.

Compagnie Francaise des Petroles: *See—*
Helderle, Paul M.; Arnaud, Fabrice R.; and Le Nours, Yannick, 4,560,005, Cl. 166-332.000.

Compagnie Generale des Etablissements Michelin: *See—*
Mioche, Robert, 4,560,338, Cl. 425-308.000.

Comte, Michel: *See—*
Fondronnier, Jacques; Guillerm, Jean; and Comte, Michel, 4,559,987, Cl. 144-213.000.

Conner, William A., to Rockwell International Corporation. Method of predistorting a single sideband system. 4,561,111, Cl. 455-63.000.

Continental Group, Inc., The: *See—*
Shepard, John K.; and Roberson, Carl, 4,560,080, Cl. 220-67.000.
White, Roger B., 4,559,729, Cl. 40-306.000.

Continental Packaging Company, Inc.: *See—*
Roth, Donald J., 4,560,566, Cl. 426-399.000.

Continental White Cap, Inc.: *See—*
Boik, Elmer J., 4,560,076, Cl. 215-252.000.
Daniels, Ben G.; Hall, Nicholas E.; Naples, Daniel F.; and Schnell, Albert C., 4,559,760, Cl. 53-314.000.

Control Technology, Inc.: *See—*
Ferguson, Frank T., 4,560,886, Cl. 307-64.000.

Cook, Charles E. Trailer hitch guide. 4,560,183, Cl. 280-477.000.

Cook, Wayne L.: *See—*
Rebhahn, Robert W. J.; and Cook, Wayne L., 4,560,746, Cl. 534-840.000.

Coombs, Daniel M.: *See—*
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., 4,560,468, Cl. 208-110.000.

Cooney, James S.; and Boyle, Stephen A., to Pylon Company, Inc. Self-cleaning tri-cusp signal contact. 4,560,223, Cl. 339-95.00R.

Cooper Industries, Inc.: *See—*
Wilhelmson, Jack L.; and Urban, Paul L., 4,560,101, Cl. 228-54.000.

Coppa, Louis: *See—*
Zava, Francis; and Coppa, Louis, 4,559,820, Cl. 73-161.000.

Coquillart, Michel; and Yeretzian, Georges, to Manufacture de Vilebrequins. Automatic machine for high efficiency machinings, embodying a cyclical process of combined translations and machining steps. 4,559,681, Cl. 29-26.00A.

Cordes, Charles. Drum brush. 4,559,860, Cl. 84-422.00S.

Cordova, Elmer R.; and Cordova, Jeffrey D. Vault machine. 4,560,335, Cl. 425-62.000.

Cordova, Jeffrey D.: *See—*
Cordova, Elmer R.; and Cordova, Jeffrey D., 4,560,335, Cl. 425-62.000.

Cornelius Company, The: *See—*
McMillin, John R.; and Strandwitz, Peter, 4,560,089, Cl. 222-14.000.

Cornell Research Foundation: *See—*
Saxena, Brij B.; and Rathnam, Premila, 4,560,649, Cl. 435-7.000.

Corning Glass Works: *See—*
Luong, John C., 4,560,399, Cl. 65-18.100.

Cornu, Roger; and Meier, Pierre-Andre , to Technobal S.A. Contact device for use in the testing of printed circuits and a removable contact head for use in such a device. 4,560,926, Cl. 324-158.00P.

Corral, Jose R.: *See*—
Beseme, Jean H.; Corral, Jose R.; and Glotin, Bernard J., 4,559,709, Cl. 33-178.00F.

Cory, John H.; and Zuckerman, Ben H. Positioning assembly for a furniture panel or like component. 4,559,658, Cl. 5-433.000.

Coscia, Charles M., to D. L. Auld Company, The. Decorative trim strips and process for making the same. 4,560,596, Cl. 428-31.000.

Cosden Technology, Inc.: *See*—
Rutledge, Raleigh N., 4,560,334, Cl. 425-4.00C.

Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, to Rhone-Poulenc Sante. Process for the preparation of 4-hydroxy-2,4,6-trimethyl-2,5-cyclohexadienone. 4,560,801, Cl. 568-362.000.

Coste, Jean-Claude: *See*—
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, 4,560,885, Cl. 307-10.00R.

Cotreau, Gerald M.: *See*—
Prentice, John S.; and Cotreau, Gerald M., 4,560,948, Cl. 330-282.000.

Cotter, David, to British Telecommunications. Optical transmission. 4,560,246, Cl. 350-96.160.

Cotton, Gerald L.: *See*—
Henderson, Charles J.; and Cotton, Gerald L., 4,560,561, Cl. 426-74.000.

Coulter Electronics, Inc.: *See*—
Bauer, Henry W., III; and Shukla, Ravindra S., 4,560,650, Cl. 435-15.000.

Counterman, Wayne S., to Air Preheater Company, Inc., The. Recuperative heat exchanger having radiation absorbing turbulator. 4,559,998, Cl. 165-109.100.

Cowan, Michael A., to Stiksack STS S.A. Plastics film and bags and sacks therefrom. 4,560,598, Cl. 428-35.000.

Cowen, David W.: *See*—
Negus, Paul D.; Ng, Tak C.; Badge, Roger; and Cowen, David W., 4,560,943, Cl. 329-103.000.

Coyle, Everett T., Jr.: *See*—
Crowley, Harris L., Jr.; and Coyle, Everett T., Jr., 4,561,041, Cl. 361-433.000.

CPC International Inc.: *See*—
Datta, Rathin; and Zeikus, Joseph G., 4,560,658, Cl. 435-160.000.

Craig, Robert L.; Hunter, Iain; and Packard, Paul D., to Barr & Stroud Limited. Apparatus for identifying the position of a body. 4,561,063, Cl. 364-559.000.

Cramp, John H. W.; Murray, Robert T.; Reid, Robert F.; and Mortier, Roy M., to Imperial Chemical Industries, PLC. Fibre optic sensor with bonded dye. 4,560,248, Cl. 350-96.340.

Crane, Hewitt D.; and Ostrem, John S., to Communication Intelligence Corporation. Complex pattern recognition method and system. 4,561,105, Cl. 382-13.000.

Crawford, Delmar E.: *See*—
Bair, Eugene C.; and Crawford, Delmar E., 4,559,698, Cl. 29-598.000.

Crawford, James I.; and Howell, W Max, to United States of America, Army. Spin stabilized impulsively controlled missile (SSICM). 4,560,120, Cl. 244-3.220.

Crawford, Knute S., to Honeywell Information Systems, Inc. Input-/output multiplexer for a data processing system. 4,561,053, Cl. 364-200.000.

Credali, Lino; Parrini, Paolo; Milano, Mario; and Lori, Domenico, to Montedison S.p.A. Process for preparing moisture-resistant packing cardboard. 4,560,429, Cl. 156-208.000.

Cress, Allan K.; and Busse, Charles E., to Maryland Cup Corporation. Apparatus for manufacturing foam plastic containers by use of a tubular forming mandrel. 4,559,765, Cl. 53-557.000.

Crews, George M.: *See*—
Allan, G. Graham; Freepons, Donald E.; and Crews, George M., 4,560,400, Cl. 71-29.000.

Cribiu', Leonardo: *See*—
Cribiu', Oreste; and Cribiu', Leonardo, 4,560,070, Cl. 209-664.000.

Cribiu', Oreste; and Cribiu', Leonardo, to Crizaf di O. & L. Cribiu' S.n.c. Device for separation of sprues from molded pieces of different shapes and sizes. 4,560,070, Cl. 209-664.000.

Crizaf di O. & L. Cribiu' S.n.c.: *See*—
Cribiu', Oreste; and Cribiu', Leonardo, 4,560,070, Cl. 209-664.000.

Crossan, J. Robert, to Shell Oil Company. Thermoplastic molding composition. 4,560,727, Cl. 525-95.000.

Croteau, Michael. Accessory tray for portable computer. 4,560,066, Cl. 206-501.000.

Crowder, John G., to EIGD Limited. Infrared absorption gas detector. 4,560,875, Cl. 250-343.000.

Crowley, Harris L., Jr.; and Coyle, Everett T., Jr., to Union Carbide Corporation. Escapsulated chip capacitor assemblies. 4,561,041, Cl. 361-433.000.

Crumb, Donald A.: *See*—
Steer, John E.; and Crumb, Donald A., 4,559,781, Cl. 60-562.000.

Crump, Druce K.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; and Crump, Druce K., 4,560,548, Cl. 424-1.100.

Crupi, Franco A.; Bzowski, Christopher; and Measures, Ernest R. Machine for softening an asphalt road surface. 4,559,922, Cl. 126-271.20A.

Crystaplex Plastics Ltd.: *See*—
Rogers, David J., 4,559,751, Cl. 52-665.000.

Cummins Engine Company, Inc.: *See*—
Ritchey, Stephen; and Kruse, Jerry L., 4,559,782, Cl. 60-605.000.
Ritchey, Stephen, 4,560,718, Cl. 524-13.000.
Van der Stuyf, Allen F., 4,559,995, Cl. 165-47.000.

Curiel, Maurice. Process for the recovery of oil from avocado fruit. 4,560,568, Cl. 426-417.000.

Currie, Thomas P., to Sperry Corporation. Integrated circuit package with integral heating circuit. 4,561,006, Cl. 357-28.000.

Curry, John D.; and Edwards, James B., to Procter & Gamble Company, The. Laundry detergent composition with enhanced stain removal. 4,560,492, Cl. 252-110.000.

Curtis Instruments, Inc.: *See*—
Finger, Eugene P., 4,560,937, Cl. 324-433.000.

Cutler, Donald R., to Chicago Bridge & Iron Company. Shell and tube heat exchanger with tube top end wiper to free solids. 4,559,997, Cl. 165-94.000.

Czempiel, Ernst-Michael: *See*—
Weber, Jens; and Czempiel, Ernst-Michael, 4,560,833, Cl. 179-2.0TV.

D. L. Auld Company, The: *See*—
Coscia, Charles M., 4,560,596, Cl. 428-31.000.

Dage, Richard C.: *See*—
Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, 4,560,700, Cl. 514-423.000.

Dahl, Roger W.; and Mayer, David W., to Cardiac Pacemakers, Inc. Catheter assembly. 4,559,951, Cl. 128-642.000.

Dahlke, William R. Bakery proofer appliances. 4,560,139, Cl. 249-112.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Horiguchi, Satoru; and Harima, Hiroshi, 4,561,103, Cl. 382-1.000.
Okushita, Masataka, 4,560,090, Cl. 222-81.000.

Daimler-Benz: *See*—
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.

Daimler-Benz Aktiengesellschaft: *See*—
Grimm, Hermann; Volz, Wolfgang; Supper, Ottmar; and Pfeiffer, Martin, 4,560,973, Cl. 338-28.000.
Koelle, Erwin; and Klink, Josef, 4,560,202, Cl. 297-410.000.
Lang, Werner; and Kretschmer, Jurgen, 4,560,189, Cl. 285-158.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Sakamoto, Takashi; Sano, Tetsuo; Kodama, Eiji; and Choh, Masamichi, 4,561,061, Cl. 364-550.000.

Daiwa Alloy Mfg. Co.: *See*—
Saito, Yu; and Harada, Tsuneo, 4,560,615, Cl. 428-328.000.

Dalmaso, George C., to WGM Safety Corp. Security device. 4,560,029, Cl. 182-5.000.

Dambach, Philip J., to Molex Incorporated. Drawer connector. 4,560,222, Cl. 339-75.0MP.

Dana Corporation: *See*—
Cochran, Stephen C.; and Terwoerds, Francis J., 4,559,846, Cl. 74-665.0GA.
Flotow, Richard A.; and Sink, William H., 4,560,048, Cl. 192-70.120.

Dang, Hiep D.: *See*—
Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., 4,560,452, Cl. 204-98.000.

Danico, Henry F., to TRW Inc. Closure and method for an aperture. 4,560,083, Cl. 220-307.000.

Daniels, Ben G.; Hall, Nicholas E.; Naples, Daniel F.; and Schnell, Albert C., to Continental White Cap, Inc. Universal capping machine. 4,559,760, Cl. 53-314.000.

Daniels, Lewis D. Boat and motor vehicle trailer. 4,560,316, Cl. 414-481.000.

Daniels, Seymour C.: *See*—
Dixon, Paul L.; and Daniels, Seymour C., 4,560,031, Cl. 182-129.000.

Darling, Phillip H. Toy puzzle. 4,560,164, Cl. 273-155.000.

Darnell Corporation, Ltd.: *See*—
Bonzer, Richard C.; and Greene, Frederick C., 4,559,669, Cl. 16-44.000.

Datta, Pabitra, to RCA Corporation. High-density information disc lubricants. 4,560,601, Cl. 428-64.000.

Datta, Pabitra: *See*—
Fox, Leonard P.; Datta, Pabitra; Matthies, Dennis L.; and Kawamoto, Hirohisa, 4,561,087, Cl. 369-276.000.

Datta, Rathin; and Zeikus, Joseph G., to CPC International Inc. Production of butanol by fermentation in the presence of carbon monoxide. 4,560,658, Cl. 435-160.000.

Daughtry, Arthur C.; and McDonald, William M., to Exxon Production Research Co. Method and apparatus for determining the distance and angular orientation between two structurally unconnected members. 4,559,716, Cl. 33-529.000.

Davenport, Kenneth G.; and Hilton, Charles B., to Celanese Corporation. Process for producing 4-acetoxyacetanilide. 4,560,789, Cl. 560-142.000.

David, Constant V. Macerator-decanter. 4,560,473, Cl. 210-173.000.

Davidson, Thomas A.; and Murray, Robert J., to Pennwalt Corporation. Process for preparing pyrrolo[1,2-a]imidazoles and imidazo[1,2-a]pyridines. 4,560,758, Cl. 546-121.000.

Davis, Burns; and Barbee, Robert B., to Eastman Kodak Company. Polyester resins capable of forming containers having improved gas barrier properties. 4,560,741, Cl. 528-302.000.

Davis, Clint A.; and Trail, Melvin P., to Beckworth Davis International, Inc. Microprocessor controlled welding apparatus. 4,561,059, Cl. 364-477.000.

Davis, George B., to Environmental Air Control, Inc. Compact blower and filter assemblies for use in clean air environments. 4,560,395, Cl. 55-276.000.

Davis, Gerald E., to Atlantic Richfield Company. Production of low silica content, high purity alumina. 4,560,541, Cl. 423-126.000.

Davis, Lorne A., Jr.; and Haskin, Helen K., to Texaco Inc. Two dimensional microwave chemical flood testing means and method. 4,560,002, Cl. 166-252.000.

Davis, Milton W., Jr., to University of South Carolina. Catalyzed hydrogenation and dehydrogenation processes. 4,560,816, Cl. 585-266.000.

Davis, Ralph L.: *See—*
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.

Davis, Thomas: *See—*
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., 4,560,468, Cl. 208-110.000.

Dayco Corporation: *See—*
Long, Delmar D., 4,560,610, Cl. 428-246.000.

Dayton Reliable Tool & Mfg. Co.: *See—*
Brown, Omar L., 4,559,800, Cl. 72-342.000.

DCA Food Industries, Inc.: *See—*
Chin, Joseph T., 4,560,337, Cl. 425-288.000.

De La Rue Systems Limited: *See—*
Hosking, Steven M.; and Dixon, Christopher J., 4,560,155, Cl. 271-11.000.

Deal, Samuel B.; and Bartch, Donald W., to RCA Corporation. Method for preparing lithium-silicate glare-reducing coating. 4,560,581, Cl. 427-64.000.

DeBaun, Kenneth W., to Air Monitor Corporation. Flow measuring traverse probe. 4,559,835, Cl. 73-861.660.

De Boynton, William L.; Lee, Frederick C.; Wilson, Bruce E.; and O'Rourke, John F., to Hydril Company. Workpiece gaging apparatus. 4,559,711, Cl. 33-199.00R.

Dechert, Ralf: *See—*
Eckstein, Rolf; and Dechert, Ralf, 4,560,310, Cl. 409-233.000.

Decoto Aircraft Inc.: *See—*
Gellerson, Walter G., 4,559,865, Cl. 92-5.00L.

Deere & Company: *See—*
McKee, Kevin D., 4,561,055, Cl. 364-424.100.
Newendorp, Bruce C.; Sturtz, Terry L.; and Anderson, Lawrence V., 4,559,847, Cl. 74-710.500.

Defago, Raymond; and Guz, Sabahattin, to Ciba-Geigy Corporation. Aqueous formulations for dyeing and printing blended fabrics. 4,560,387, Cl. 8-527.000.

De Forrest, William, Sr. Door lock status indicator. 4,559,796, Cl. 70-432.000.

Degussa Aktiengesellschaft: *See—*
Nethe, Hans W.; and Nethe, Frank R., 4,560,588, Cl. 427-215.000.

Deitesfeld, Rex R., to Insulation Technology Corporation. Insulation blower. 4,560,307, Cl. 406-63.000.

DeKarske, Clarence W.; and Wilcoski, Thomas M., to Sperry Corporation. Synchronized selectable rate clocking system. 4,560,939, Cl. 328-72.000.

Delaney, Norma G.: *See—*
Weller, Harold N., III; Gordon, Eric M.; and Delaney, Norma G., 4,560,506, Cl. 260-112.50R.

De Lange, Jan H.; and Fick, Ernest, to Modsa (Proprietary) Limited. Method of and apparatus for curing tobacco. 4,559,956, Cl. 131-303.000.

Delaware: *See—*
Raymond, Roger S., 4,559,797, Cl. 72-63.000.

Deleganes, Sam M.; and Den Beste, Steven C., to Tektronix, Inc. Control system employing a rotary knob. 4,561,049, Cl. 364-130.000.

Delio, Ralph D.; and Diemer, Donald J. Method and apparatus for forging wedge-shaped parts. 4,559,804, Cl. 72-356.000.

Della Bella, Davide: *See—*
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, 4,560,696, Cl. 514-397.000.

Deller, David L., to TRW Inc. Cutting tool. 4,560,308, Cl. 407-53.000.

Delzell, Susan C.: *See—*
Barry, Robert F.; Delzell, Susan C.; Wilson, John F.; and Nylund, Theodore W., 4,560,532, Cl. 376-434.000.

Demaison, Gerard J.; and Kaplan, Isaac R., to Chevron Research Company. Predicting hydrocarbon potential of an earth formation underlying a body of water by analysis of seeps containing low concentrations of carbonaceous gases. 4,560,664, Cl. 436-29.000.

deMey, Charles F., II, to Perkin-Elmer Corporation, The. Slip clutch assembly. 4,560,050, Cl. 192-81.00C.

Den Beste, Steven C.: *See—*
Deleganes, Sam M.; and Den Beste, Steven C., 4,561,049, Cl. 364-130.000.

Denis, Jacques; Senneron, Michel; and Sillion, Bernard, to Institut Francais du Petrole. Dispersing additive compositions for lubricating oils and their manufacture. 4,560,490, Cl. 252-51.50A.

Dennis, Alan J., to TRW Inc. Electrical connector member and contactor unit. 4,560,226, Cl. 339-99.00R.

Dennison Manufacturing Company: *See—*
Paradis, Joseph R., 4,559,676, Cl. 24-16.0PB.

Dennison National Company: *See—*
Podosek, Edward, 4,560,299, Cl. 402-15.000.

Deppe, Gerd-Joachim; Ettwig, Hans H.; Schneider, Heinz; and Hof, Wolfram, to Mannesmann Aktiengesellschaft. Selecting the cut-off end portion of rolled sheet stock. 4,559,819, Cl. 73-159.000.

dePuglia, Gaston D.; Van der Borght, William J.; and Moitzger, Max. Encapsulation mold. 4,560,138, Cl. 249-95.000.

DePuy, Robert P., to General Electric Company. Switching regulator current limit circuit. 4,561,047, Cl. 363-56.000.

Derderian, Scott K.: *See—*
Vogt, George H.; and Derderian, Scott K., 4,560,896, Cl. 310-215.000.

Deschepper, Pierre: *See—*
Plumat, Robert; Robyn, Pierre; and Deschepper, Pierre, 4,560,591, Cl. 427-422.000.

Desffains, J. Paul: *See—*
Batard, Denis; Freland, Jean-Claude; Wallez, Bernard; Desffains, J. Paul; and Valle, Roger, 4,559,933, Cl. 128-78.000.

Design Loft, Inc.: *See—*
Herron, Matthew A., 4,560,181, Cl. 280-242.0WC.

DeSoto, Inc.: *See—*
Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,560,728, Cl. 525-123.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Linder Hohe: *See—*
Kayser, Albrecht, 4,560,328, Cl. 418-8.000.

Devenny, Kirk. Corsage support. 4,559,675, Cl. 24-5.000.

Devlin, Barry R. J., to Shell Oil Company. Method for sterilizing male parts of plants. 4,560,401, Cl. 71-88.000.

Dewald, Erwin W.: *See—*
Downing, Jack G.; Dewald, Erwin W.; and Hayes, David, 4,560,071, Cl. 211-70.800.

DeWoody, Robert O.; and Hollerich, Ralph M., to Renfro, Julian C. Multifunction wheelchair handbrake especially adapted for ramp climbing. 4,560,033, Cl. 188-2.00F.

Diab-Barracuda AB: *See—*
Johansson, Lars E., 4,560,595, Cl. 428-17.000.

Dickinson, Ben W. O., III. Method of transporting a payload in a borehole. 4,560,934, Cl. 324-323.000.

Diebold, Incorporated: *See—*
Lankard, David R.; and Shoop, James D., 4,559,881, Cl. 109-83.000.

Diemer, Donald J.: *See—*
Delio, Ralph D.; and Diemer, Donald J., 4,559,804, Cl. 72-356.000.

Diers, Ivan V.: *See—*
Nielsen, Grethe C.; Diers, Ivan V.; Outtrup, Helle; and Norman, Barrie E., 4,560,651, Cl. 435-95.000.

Dieterich Standard Corp.: *See—*
Coleman, Darrel F.; and Bond, Morris M., 4,559,836, Cl. 73-861.660.

Dietrich, Demus; Horst, Zaschke; Heinz, Altmann; and Michael, Keil. Liquid crystalline nematic compounds. 4,560,496, Cl. 252-299.610.

Diettrich, Lambert J., Jr.: *See—*
Servas, Frank; Lewin, John E.; Pavlov, Tudor; and Diettrich, Lambert J., Jr., 4,559,999, Cl. 165-156.000.

Digital Equipment Corp.: *See—*
Strecker, William D.; Buzynski, John E.; and Thompson, David, 4,560,985, Cl. 340-825.500.

Digonnet, Michel J. F.: *See—*
Shaw, Herbert J.; Bergh, Ralph A.; and Digonnet, Michel J. F., 4,560,234, Cl. 350-96.150.

Dillard, John T. Telephone junction box. 4,560,839, Cl. 179-81.00C.

Dilley, Gerald G., to Ben Clements & Sons, Inc. Twist tying machine. 4,559,977, Cl. 140-93.600.

Direct Broadcast Programs Inc.: *See—*
Wilson, Angele; and Wilson, John, 4,560,359, Cl. 446-75.000.

Director-General of Agency of Industrial Science-Technology: *See—*
Hiratani, Kazuhisa, 4,560,759, Cl. 546-178.000.
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, 4,560,640, Cl. 430-280.000.

DiSabito, David M.: *See—*
Vaughan, Raymond C.; DiSabito, David M.; Mruk, Norbert J.; and Eddy, Arthur R., Jr., 4,559,950, Cl. 128-641.000.

Dixon, Christopher J.: *See—*
Hosking, Steven M.; and Dixon, Christopher J., 4,560,155, Cl. 271-11.000.

Dixon, Paul L.; and Daniels, Seymour C. Height adjustable apparatus. 4,560,031, Cl. 182-129.000.

Dlugopolski, Joseph, to Fidelity Container Corporation. Reversible folder and round trip mailer box. 4,560,102, Cl. 229-40.000.

Doane, John C.; and Hardenbrook, David L., to Otis Elevator Company. Servicing a software-controlled elevator. 4,561,093, Cl. 371-20.000.

Dobhan, Herbert: *See—*
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Dobson, Lawrence A. Biomass-fueled furnace. 4,559,882, Cl. 110-254.000.

Dobson Park Industries Limited: *See—*
Murfitt, Raymond G., 4,560,306, Cl. 405-295.000.

Doby, Troy, to Resco Products, Inc. End block. 4,560,350, Cl. 432-241.000.

Dochow, Claude; Patterson, Mark L.; and Sanneman, Richard W., to Motorola, Inc. Radar target doppler frequency scintillation simulator and method. 4,560,987, Cl. 343-17.700.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Ampferer, Herbert, 4,559,783, Cl. 60-605.000.

Dr. -Ing. Rudolf Hell GmbH: *See—*
Jung, Eggert; Roes, Christian; Wigger, Andreas; and Ziemen, Ernst-August, 4,561,016, Cl. 358-76.000.

Dr. Johannes Heidenhain GmbH: *See—*
Oberhans, Johann, 4,559,707, Cl. 33-125.00C.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.
Dodds, Michael J.: *See*—
Bruno, David J., Jr.; Dodds, Michael J.; Fuqua, Debra L.; and Hunter, John E., 4,560,564, Cl. 426-250.000.
Dodson, Christopher E., to Torftech Limited. Method for processing matter in a turbulent mass of particulate material. 4,559,719, Cl. 34-10.000.
Doi, Takuji: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.
Doi, Yoshikazu; and Sado, Kenzo, to Fuji Photo Optical Co., Ltd. Zoom lens system. 4,560,254, Cl. 350-427.000.
Domian, Henry A.; and Weber, Charles M., to Babcock & Wilcox Company, The. Electron beam welder control. 4,560,854, Cl. 219-121.0EW.
Donig, Adolf: *See*—
Heinrich, Karl; Heichlinger, Norbert; and Donig, Adolf, 4,559,772, Cl. 57-247.000.
Dorfel, Werner H.: *See*—
Bruttel, Beat; Schneider, Hansjorg; and Dorfel, Werner H., 4,560,747, Cl. 534-887.000.
Doring, Joachim: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,560,726, Cl. 525-71.000.
Doris, Geoffrey W.: *See*—
Urrea, Peter D.; Doris, Geoffrey W.; and Newman, Stephen D., 4,559,897, Cl. 118-406.000.
Dornik, Luciano: *See*—
Geat, Mario; and Dornik, Luciano, 4,560,377, Cl. 604-68.000.
Dorsch, Werner, to Bayerische Motoren Werke Aktiengesellschaft. Heating and/or air-conditioning installation for motor vehicles. 4,560,106, Cl. 236-91.00E.
Doughty, Christine A.: *See*—
Tsang, Chin-Fu; and Doughty, Christine A., 4,559,818, Cl. 73-154.000.
Douziech, Patrick; and Imbert, Michel, to Thomson CSF. Method and circuit for frequency and phase locking a local oscillator for television. 4,561,014, Cl. 358-25.000.
Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr.; and Hunter, Douglas L., 4,560,768, Cl. 548-435.000.
Hinkel, Jerald J., 4,560,486, Cl. 252-8.55R.
Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., 4,560,452, Cl. 204-98.000.
Pischke, James W.; McFadden, Russell T.; Krause, Ruben L.; and Moore, Charles H., 4,560,736, Cl. 526-312.000.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; and Crump, Druce K., 4,560,548, Cl. 424-1.100.
Dowa Metal Developping Center Co., Ltd.: *See*—
Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, 4,560,415, Cl. 106-286.300.
Dowa Mining Co., Ltd.: *See*—
Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, 4,560,415, Cl. 106-286.300.
Downey, Philip L. Helmut strap fastener. 4,559,679, Cl. 24-615.000.
Downing Displays, Inc.: *See*—
Downing, Jack G.; Dewald, Erwin W.; and Hayes, David, 4,560,071, Cl. 211-70.800.
Downing, Jack G.; Dewald, Erwin W.; and Hayes, David, to Downing Displays, Inc. Display devices for displaying fishing poles and fishing reels. 4,560,071, Cl. 211-70.800.
Draper, David L., to Cars & Concepts, Inc. Vehicle instrument panel applique with glove box. 4,560,602, Cl. 428-79.000.
Droz, Francois, to Brevex Georges Claude S.A. Display unit for jewelry articles. 4,560,133, Cl. 248-442.000.
Drozd, Jan W.; and Bailey, Maureen L., to Shell Oil Company. Microbiological production of alkylene oxides. 4,560,657, Cl. 435-123.000.
Druetzler, Thomas W., to Sherwin-Williams Company, The. Isocyanate functional prepolymers and coating materials based thereon. 4,560,494, Cl. 252-182.000.
D'Souza, Adrian: *See*—
Bakshi, Kiran R.; D'Souza, Adrian; and Sabourin, Edward T., 4,560,800, Cl. 568-306.000.
DuBois, R. Clark. Device for drop-feeding sheet material into a printing apparatus or the like. 4,560,156, Cl. 271-18.000.
Dubuisson, Joseph E. Case with rotary telescopic sections. 4,560,078, Cl. 220-4.00C.
Duel, Don M.; and Smith, Fred J., to Motorola, Inc. Method and apparatus for the measurement of the internal circumference of compliant rings. 4,559,708, Cl. 33-178.00R.
Duncan, L. Scot; Groth, Hugh F.; and Basile, Peter A., to Regina Corporation. Air-liquid separator for cleaning devices. 4,559,666, Cl. 15-353.000.
Duncan, William S., to International Business Machines Corporation. Oscillator with crystal-resistive feedback. 4,560,956, Cl. 331-116.00R.
Dunn, Robert M. Power-driven lawnmower. 4,559,768, Cl. 56-16.900.
Du Pont de Nemours, E. I., and Company: *See*—
Squire, Edward N., 4,560,778, Cl. 549-455.000.
Durametallic Corporation: *See*—
Adams, William V.; and Avard, Duane A., 4,560,173, Cl. 277-15.000.
Durieux, Francois P., to Clextral. Automatic purger for a hydraulically controlled double diaphragm pump. 4,560,324, Cl. 417-383.000.
Duriron Company, Inc., The: *See*—
Sumner, Earl C., 4,560,607, Cl. 428-141.000.
Dutt, Herbert V., to Sun Coast Plastics, Inc. Plastic closure cap. 4,560,077, Cl. 215-307.000.
Dwyer Instruments, Inc.: *See*—
Phillips, James W.; and Kobos, Duane M., 4,559,834, Cl. 73-861.550.
Dybas, Richard A., to Merck & Co., Inc. Synergistic avermectin combination for treating plant pests. 4,560,677, Cl. 514-30.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Mannhart, Alto; and Rieger, Georg, 4,559,691, Cl. 29-283.500.
Dynamit Nobel AG: *See*—
Zoche, Gunter; and Vogt, Wilhelm, 4,560,787, Cl. 560-52.000.
E. R. Squibb & Sons, Inc.: *See*—
Hall, Steven E.; and Haslanger, Martin F., 4,560,698, Cl. 514-469.000.
Karanewsky, Donald S., 4,560,681, Cl. 514-82.000.
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,560,680, Cl. 514-82.000.
Weller, Harold N., III; Gordon, Eric M.; and Delaney, Norma G., 4,560,506, Cl. 260-112.50R.
Eales, David F., to British Gas Corp. Particulate solid storage container and transport method. 4,560,094, Cl. 222-195.000.
East, Gary P.: *See*—
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,560,375, Cl. 604-9.000.
Eastman, Dean E.; Eldridge, Jerome M.; Petersen, Kurt E.; and Olive, Graham, to International Business Machines Corporation. Cooling system for VLSI circuit chips. 4,561,040, Cl. 361-385.000.
Eastman, Jay M.; and Boles, John A., to Skan-A-Matic Corp. System for optical scanning over a large depth of field. 4,560,862, Cl. 235-467.000.
Eastman Kodak Company: *See*—
Bayer, Bryce E., 4,561,022, Cl. 358-167.000.
Davis, Burns; and Barbee, Robert B., 4,560,741, Cl. 528-302.000.
Geyer, Frederick F., 4,561,086, Cl. 369-100.000.
Loblaw, James C.; and Lussier, Barbara B., 4,560,638, Cl. 430-264.000.
Schutrum, Walter L., 4,560,991, Cl. 346-75.000.
Eaton Corporation: *See*—
Bradshaw, Cyril E., 4,559,971, Cl. 137-596.170.
Meier, Paul J., 4,560,964, Cl. 333-202.000.
Ryczek, Lawrence J., 4,560,891, Cl. 307-597.000.
Ryczek, Lawrence J., 4,560,892, Cl. 307-597.000.
Ebara Corporation: *See*—
Nishimori, Sinji, 4,560,476, Cl. 210-416.100.
Ebert, Rolf; Knorreck, Peter; Kramer, Manfred; and Merkel, Wilfried, to Robert Bosch GmbH. Displacement transducer for detecting the position of an adjusting device. 4,559,816, Cl. 73-119.00A.
Eck, Herbert: *See*—
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,560,724, Cl. 524-734.000.
Eck, Leonard F., to Hein-Werner Corporation. Anchor stand. 4,560,131, Cl. 248-352.000.
Eckardt AG: *See*—
Brenner, Paul, 4,559,866, Cl. 92-39.000.
Eckstein, Rolf; and Dechert, Ralf, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co. Tool holder for boring, milling and the like machine tools. 4,560,310, Cl. 409-233.000.
Eda, Kensaku: *See*—
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.
Edayoshi, Tomoko: *See*—
Narimatsu, Hiroki; Sakamoto, Kenshi; Edayoshi, Tomoko; and Kubota, Hayato, 4,560,560, Cl. 426-38.000.
Eddleston, Michael J.; and Hume, Christopher, to Burroughs Corporation. Equipment enclosure. 4,560,079, Cl. 220-4.00R.
Eddy, Arthur R., Jr.: *See*—
Vaughan, Raymond C.; DiSabito, David M.; Mruk, Norbert J.; and Eddy, Arthur R., Jr., 4,559,950, Cl. 128-641.000.
Edele, Reinhard: *See*—
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.
Edelmann, Ludwig: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Edison Price, Incorporated: *See*—
Price, Edison A., 4,559,728, Cl. 40-124.200.
Edwards, James B.: *See*—
Curry, John D.; and Edwards, James B., 4,560,492, Cl. 252-110.000.
Edwards, James W.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,560,674, Cl. 502-209.000.
Efner, Howard F.: *See*—
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., 4,560,468, Cl. 208-110.000.
Eftefield, Larry G.; Simmons, Gerald P.; and Stone, Gregory L., to Caterpillar Tractor Co. Method and apparatus for fragmenting asphalt. 4,560,207, Cl. 299-10.000.

Egami, Hidemi: *See—*
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.
Egawa, Yoshinori, to Yamaichi Electric Mfg. Co., Ltd. Connector with component removal means. 4,560,216, Cl. 339-12.00V.
Eggers, Rudolf: *See—*
Coenen, Hubert; Eggers, Rudolf; and Hagen, Rainer, 4,560,513, Cl. 260-403.000.
Egyesult Izzolampa es Villamossagi RT.: *See—*
Kerekes, Bela, 4,560,906, Cl. 315-47.000.
Ehlers, Jerry W.: *See—*
Smith, James W.; and Ehlers, Jerry W., 4,561,075, Cl. 367-46.000.
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Polymer alloys having a mat surface. 4,560,726, Cl. 525-71.000.
Eick, Hans-Joachim: *See—*
Funke, Gunther; and Eick, Hans-Joachim, 4,559,799, Cl. 72-224.000.
EIGD Limited: *See—*
Crowder, John G., 4,560,875, Cl. 250-343.000.
Eigyo, Masami: *See—*
Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, 4,560,684, Cl. 514-221.000.
Eirich, Hubert: *See—*
Eirich, Paul; Eirich, Hubert; Eirich, Walter; and Goldschmidt, Erwin, 4,560,283, Cl. 366-188.000.
Eirich, Paul; Eirich, Hubert; Eirich, Walter; and Goldschmidt, Erwin, to Eirich, Paul; Eirich, Hubert; and Eirich, Walter. Apparatus for closing and continuously emptying the container of a treatment machine. 4,560,283, Cl. 366-188.000.
Eirich, Walter: *See—*
Eirich, Paul; Eirich, Hubert; Eirich, Walter; and Goldschmidt, Erwin, 4,560,283, Cl. 366-188.000.
Eisenberg, William. Method utilizing a laser for eye surgery. 4,559,942, Cl. 128-303.000.
Eisenstatt, Larry R.; and Radford, Kenneth C., to Westinghouse Electric Corp. Method for coating a nuclear fuel with boron nitride. 4,560,575, Cl. 427-6.000.
Eisert, Manfred: *See—*
Weberndoerfer, Volkmar; Brunnmueller, Friedrich; Eisert, Manfred; and Bermes, Rudolf, 4,560,745, Cl. 534-728.000.
Elbaum, Marek: *See—*
Lizzi, Frederic L.; Elbaum, Marek; and Feleppa, Ernest J., 4,561,019, Cl. 358-112.000.
Elco International K.K.: *See—*
Shirai, Kazuo, 4,560,231, Cl. 339-258.0RR.
Eldridge, Jerome M.: *See—*
Eastman, Dean E.; Eldridge, Jerome M.; Petersen, Kurt E.; and Olive, Graham, 4,561,040, Cl. 361-385.000.
Electrical Hardware, Inc.: *See—*
Judkins, Milton W.; and Williams, Arthur C., 4,560,126, Cl. 248-72.000.
Electricite de France: *See—*
Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, 4,559,993, Cl. 165-1.000.
Elektroschmelzwerk Kempten GmbH: *See—*
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,560,668, Cl. 501-92.000.
Elger, Walter: *See—*
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.
Eli Lilly and Company: *See—*
Hirsch, Kenneth S.; Jones, Charles D.; Taylor, Harold M.; and Winter, Mark A., 4,560,695, Cl. 514-372.000.
Johnson, Ronald D.; Kastner, Ralph E.; and Boeck, LaVerne D., 4,560,509, Cl. 260-239.30P.
Spry, Douglas O., 4,560,749, Cl. 544-16.000.
Ellar B.M.: *See—*
Larom, Dov; and Shahar, Gabriel, 4,559,912, Cl. 123-350.000.
Elphick, Albert R.: *See—*
Baxter, Martin G.; Elphick, Albert R.; Miller, Alistair A.; and Sawyer, David A., 4,560,687, Cl. 514-242.000.
ELTECH Systems Corporation: *See—*
Nguyen, Thinh; Wiaux, Jean-Pol; and Vance, Christopher J., 4,560,446, Cl. 204-58.500.
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,560,448, Cl. 204-67.000.
Eltro GmbH: *See—*
Hien, Rochus; Weigel, Wolfgang; and Vierling, Horst, 4,560,869, Cl. 250-235.000.
Emerson, Edwin E. Golfer's head movement indicating device. 4,560,166, Cl. 273-183.00B.
Emery, Phillip L.: *See—*
Price, William F.; and Emery, Phillip L., 4,560,195, Cl. 296-1.00S.
Emmel, Werner: *See—*
Wolf, Heinz; and Emmel, Werner, 4,559,972, Cl. 137-614.110.
Emmons, Daniel R.; and Swanson, William E., to GTI Corporation. Cross product calculator with normalized output. 4,561,066, Cl. 364-736.000.
Enderle, Eckhard; and Kaufmann, Dieter, to Carl-Zeiss-Stiftung. Gas bearing. 4,560,213, Cl. 308-5.00R.
Endo, Kiyonobu: *See—*
Matsumoto, Kazuya; and Endo, Kiyonobu, 4,561,032, Cl. 360-114.000.
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, to Shin-Etsu Chemical Co., Ltd. Method for providing a coating layer of silicon carbide on substrate surface. 4,560,589, Cl. 427-249.000.
Enei, Hitoshi: *See—*
Kurahashi, Osamu; Kamada, Masahiro; and Enei, Hitoshi, 4,560,652, Cl. 435-108.000.
Enertec: *See—*
Heller, Isabelle; and Loewenstein, Paul, 4,560,922, Cl. 324-52.000.
Engebretson, Harold J.: *See—*
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,559,713, Cl. 33-302.000.
Engel, Thomas H. Container support apparatus. 4,559,747, Cl. 52-40.000.
Engeler, Paul; and Wolfer, Peter, to Kistler Instrumente A.G. High pressure transducer. 4,559,821, Cl. 73-167.000.
Engler, Manfred: *See—*
Bode, Gunter; Meier, Horst; and Engler, Manfred, 4,559,763, Cl. 53-527.000.
ENI - Ente Nazionale Idrocarburi: *See—*
Pinori, Massimo; and Verdini, Antonio S., 4,560,505, Cl. 260-112.50R.
Enochs, Frank L.; and Kohler, Michael B., to Frito-Lay, Inc. Container handling system. 4,560,058, Cl. 198-426.000.
Enomoto, Koji: *See—*
Suzuki, Kunihiko; and Enomoto, Koji, 4,560,025, Cl. 180-247.000.
Enomoto, Kouji: *See—*
Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, 4,560,198, Cl. 296-185.000.
Environmental Air Control, Inc.: *See—*
Davis, George B., 4,560,395, Cl. 55-276.000.
Enyi, Donatus O. Nuke awareness game. 4,560,170, Cl. 273-248.000.
Eppendorf Geratebau Netheler & Hinz GmbH: *See—*
Baldszun, Karl; Grazianski, Thomas; and Kuhn, Gunther, 4,560,269, Cl. 356-246.000.
Epple, Anton: *See—*
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.
Epworth, Richard E., to International Standard Electric Corporation. Optical frequency modulation system. 4,561,119, Cl. 455-609.000.
Erickson, Gordon. Hockey game. 4,560,163, Cl. 273-85.00R.
Eriksen, Joern B.: *See—*
Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., 4,560,989, Cl. 346-1.100.
Erk, Gayyur; and Korlatzki, Rudi, to Naturin-Werk Becker & Company. Single-layer elastic tubular film of polyamide used for packaging paste substances and a process for the production of such film. 4,560,520, Cl. 264-22.000.
Ernst, Edwin R.: *See—*
Kramer, George M.; and Ernst, Edwin R., 4,560,825, Cl. 585-724.000.
Ernst, Horst M.: *See—*
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Ertl, James L., to Zwicker Knitting Mills. Work glove. 4,559,646, Cl. 2-16.000.
Escher Wyss GmbH: *See—*
Holik, Herbert, 4,560,474, Cl. 210-221.200.
ESPE Fabrik Pharmazeutischer Praparate GmbH: *See—*
Neumeister, Alexander; and Herold, Wolf-Dietrich, 4,560,352, Cl. 433-90.000.
ETA S.A., Fabriques d, E bauches: *See—*
Mock, Elmar; and Bron, Alphonse, 4,561,077, Cl. 368-282.000.
ETAT Francais: *See—*
Lafonta, Fernande F.; and Lafonta, Paul A., 4,560,914, Cl. 320-1.000.
Ethicon, Inc.: *See—*
Koelmel, Donald; and Shalaby, Shalaby W., 4,559,945, Cl. 128-335.500.
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Bacon, Forrest C., 4,559,754, Cl. 53-53.000.

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Daughtry, Arthur C.; and McDonald, William M., 4,559,716, Cl. 33-529.000.
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Canevari, Gerard P., 4,560,482, Cl. 210-749.000.
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Kramer, George M.; and Ernst, Edwin R., 4,560,825, Cl. 585-724.000.
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Knapke, David M.; and Johnson, Kenneth C., 4,559,900, Cl. 118-672.000.
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Anand, Kranti; and Strain, Robert J., 4,559,696, Cl. 29-576.00B.
Khan, Aurangzeb K., 4,561,095, Cl. 371-38.000.
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Fauser, Hans, to J. M. Voith GmbH. Heatable roll. 4,560,860, Cl. 219-470.000.
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Schora, Frank C.; Janka, John C.; and Feldkirchner, Harlan L., 4,560,547, Cl. 423-650.000.
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Lizzi, Frederic L.; Elbaum, Marek; and Feleppa, Ernest J., 4,561,019, Cl. 358-112.000.
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Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,560,908, Cl. 315-219.000.
Felsvang, Karsten S.: *See—*
Caspersen, Leif D.; Felsvang, Karsten S.; and Schwartzbach, Christian, 4,560,543, Cl. 423-242.000.
Fenton, Francis M.: *See—*
Carson, Robert A.; Fenton, Francis M.; and Jones, David F., 4,560,837, Cl. 179-18.0BD.
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Staub, Samuel, 4,560,159, Cl. 271-263.000.
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Schmidts, Kurt; Feyh, Hans-Otto; and Mania, Max J., 4,560,114, Cl. 242-71.800.
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Burton, Thomas M.; and Kucharska, Helena Z., 4,560,706, Cl. 521-85.000.
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Wkossner, Felix, 4,560,041, Cl. 188-278.000.
Fick, Ernest: *See—*
De Lange, Jan H.; and Fick, Ernest, 4,559,956, Cl. 131-303.000.
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Dlugopolski, Joseph, 4,560,102, Cl. 229-40.000.
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Field, Leslie A., to Chevron Research Company. Alkylaromatic dealkylation. 4,560,820, Cl. 585-489.000.
Fields, Ellis K.; and Winzenburg, Mark L., to Standard Oil Company (Indiana). Quaternary ammonium compounds containing an anhydride group. 4,560,761, Cl. 546-283.000.
Finger, Eugene P., to Curtis Instruments, Inc. Battery state of charge metering method and apparatus. 4,560,937, Cl. 324-433.000.
Fink, Arthur C., Jr., to Husky Corporation. Pressure actuated poppet valve for fuel dispensing nozzle. 4,559,982, Cl. 141-206.000.
Finn, Steven G., to Codex Corporation. Data compression. 4,560,976, Cl. 340-347.0DD.
Finter, Jurgen; and Fischer, Walter, to Ciba Geigy Corporation. Use of photosensitive compositions of matter for electroless deposition of metals. 4,560,643, Cl. 430-346.000.
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Wexler, Jonathan B., 4,559,745, Cl. 52-1.000.
Firestone, Raymond A., to Merck & Co., Inc. Derivatives of steroid compounds linked to cyotoxic agents. 4,560,512, Cl. 260-397.200.
Fischell, Robert E. Manually actuated fully implantable penile erection device. 4,559,931, Cl. 128-79.000.
Fischer, Martin: *See—*
Menig, Helmuth; Fischer, Martin; and Baer, Karl, 4,560,769, Cl. 548-560.000.
Fischer, Walter: *See—*
Finter, Jurgen; and Fischer, Walter, 4,560,643, Cl. 430-346.000.
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Burlage, Brian J.; Wiklund, David E.; and Lenz, Gary A., 4,559,832, Cl. 73-861.240.
Fisher, Glen W., to Technovators, Inc. Material blending system. 4,560,285, Cl. 366-341.000.
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Molloy, James O.; Sydenham, Peter E.; and Hulejczuk, Roman A., 4,560,007, Cl. 169-54.000.
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Flaig, John D.; and Taipale, Dale L., to Outboard Marine Corporation. Engine block with unitarily cast exhaust gas passages and water jacket cavity. 4,559,908, Cl. 123-41.280.
Flaig, Ulrich; Grieshaber, Hermann; Sieber, Albrecht; and Wietelmann, Jurgen, to Robert Bosch GmbH. Control device for inactivating an internal combustion engine. 4,559,914, Cl. 123-359.000.
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Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, 4,559,993, Cl. 165-1.000.
Flare Products, Inc.: *See—*
Tharel, Morene J., 4,560,380, Cl. 604-385.00R.
Flood, Gary N., to Branson Ultrasonics Corporation. Ultrasonic seal and cut method and apparatus. 4,560,427, Cl. 156-73.300.
Florida Progress Corporation: *See—*
Ashworth, Robert A., 4,560,391, Cl. 44-51.000.
Flotow, Richard A.; and Sink, William H., to Dana Corporation. Cooling system for friction clutches for vehicles. 4,560,048, Cl. 192-70.120.
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Champlin, Keith S.; and Kar, Pradip C., 4,561,088, Cl. 370-16.000.
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Focke, Heinz H.; and Liedtke, Kurt, 4,559,757, Cl. 53-176.000.
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Chin, Albert K., 4,559,927, Cl. 128-1.00R.
Fogo, Richard: *See—*
Sauer, Kenneth; and Fogo, Richard, 4,559,734, Cl. 43-4.000.
Fohler, Johann, to Voest-Alpine Aktiengesellschaft. Magazine arrangement for measuring and/or sampling probes. 4,560,314, Cl. 414-276.000.
Foley, Michael S.: *See—*
Petric, Paul F.; Foley, Michael S.; Waz, John J.; and Milgate, Robert W., III, 4,560,880, Cl. 250-441.100.
Foller, Peter C., to Chevron Research Company. Gas diffusion anode. 4,560,443, Cl. 204-283.000.
Fondronnier, Jacques; Guillerm, Jean; and Comte, Michel, to Centre Technique du Bois et de L'Ambeublement. Veneer lathe. 4,559,987, Cl. 144-213.000.
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Lucas, Jacques; and Fonteneau, Gilles, 4,560,667, Cl. 501-40.000.
Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Production of aminoethylethanolamine using rare earth metal or strontium hydrogen phosphates as catalysts. 4,560,798, Cl. 564-503.000.
Ford Motor Co.: *See—*
Kirby, Ian G., 4,560,023, Cl. 180-148.000.
McCarthy, James P.; and Byler, Richard E., 4,560,047, Cl. 192-52.000.
Stockton, Thomas R., 4,560,056, Cl. 192-113.00B.
Walsh, John P., 4,560,045, Cl. 192-3.580.
Forslund, Hans. Signboard rack. 4,559,733, Cl. 40-606.000.
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Forsythe, James A.: *See—*
Mason, Edgar G.; Clark, Harold; and Forsythe, James A., 4,559,902, Cl. 119-2.000.
Fortuna, Vincent E.: *See—*
Peterson, Bertel R.; and Fortuna, Vincent E., 4,560,064, Cl. 206-159.000.
Fory, Werner, to Ciba Geigy Corporation. Process for the preparation of 1,2-benzoxathiines. 4,560,771, Cl. 549-15.000.
Foster, Arthur M., to Occidental Chemical Corporation. Process for preparing methoxytrifluoromethylnaphthoic acid from methylnaphthoic acid. 4,560,794, Cl. 562-467.000.
Foster, L. Dale, to Hill-Rom Company, Inc. Hospital bed with a weight-distributing lever system. 4,559,656, Cl. 5-236.00R.
Foundry Automation, Inc.: *See—*
Harris, David L.; and Taylor, Colin, 4,560,281, Cl. 366-15.000.
Fouquet, Gerd: *See—*
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fouquet, Gerd, 4,560,822, Cl. 585-606.000.

Four Time Enterprises Ltd.: *See—*
Kietaibl, Josef, 4,560,344, Cl. 431-253.000.

Fowler, Seeber T. Device for teaching decimal math. 4,560,354, Cl. 434-208.000.

Fox, Leonard P.; Datta, Pabitra; Matthies, Dennis L.; and Kawamoto, Hirohisa, to RCA Corporation. Conductive video disc. 4,561,087, Cl. 369-276.000.

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Leroy, Jean-Luc, 4,560,531, Cl. 376-302.000.

Franckx, Joris R. I.; Mendes, Luiz N.; van Noten, Lodewijk; and Touchais, Thierry, to Raychem Corporation. Tubular article for branch-off seal. 4,560,828, Cl. 174-71.00R.

Frank, Ed, to Boeing Company, The. Bi-directional applicator head with dual tape supply. 4,560,433, Cl. 156-459.000.

Frank, Peter L.: *See—*
Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., 4,559,661, Cl. 15-93.00R.

Frank, Wolfram: *See—*
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.

Franklin, Lloyd C.: *See—*
Girard, Theodore A.; and Franklin, Lloyd C., 4,560,766, Cl. 548-311.000.

Frech, Karl: *See—*
Tolle, Hans; Frech, Karl; and Ludke, Hartmut, 4,560,586, Cl. 427-134.000.

Freeman, Eben W., to Scott Paper Company. Method and apparatus for surface replication on a coated sheet material. 4,560,578, Cl. 427-44.000.

Freepons, Donald E.: *See—*
Allan, G. Graham; Freepons, Donald E.; and Crews, George M., 4,560,400, Cl. 71-29.000.

Freland, Jean-Claude: *See—*
Batard, Denis; Freland, Jean-Claude; Wallez, Bernard; Desffains, J. Paul; and Valle, Roger, 4,559,933, Cl. 128-78.000.

Fresenius AG: *See—*
Herbert, Reinhold, 4,561,110, Cl. 383-128.000.

Frey, Douglas R. Monolithic voltage controlled element. 4,560,947, Cl. 330-254.000.

Frey, Thomas; Grunwald, Werner; Knoll, Gunther; and Weyl, Helmut, to Robert Bosch GmbH. Gas sensor, particularly oxygen sensor exposed to combustion exhaust gases. 4,560,463, Cl. 204-424.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Coenen, Hubert; Eggers, Rudolf; and Hagen, Rainer, 4,560,513, Cl. 260-403.000.
Greilinger, Friedrich; and Katschinski, Ulrich, 4,559,990, Cl. 164-428.000.
Gritsch, Herbert, 4,561,076, Cl. 367-88.000.

Friedlaender, Fritz J.; and Takayasu, Makoto, to Purdue Research Foundation. Method and apparatus for magnetically separating particles from a liquid. 4,560,484, Cl. 210-796.000.

Friedland, Anthony E., to Thermo King Corporation. Method of and apparatus for dip coating. 4,560,592, Cl. 427-430.100.

Friedrichsfeld GmbH - Steinzeug- und Kunststoffwerke: *See—*
Schulte, Willi; and Heimke, Gunther, 4,560,353, Cl. 433-173.000.

Frigeni, Viviana: *See—*
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, 4,560,696, Cl. 514-397.000.

Frito-Lay, Inc.: *See—*
Enochs, Frank L.; and Kohler, Michael B., 4,560,058, Cl. 198-426.000.
Ivers, John T., 4,560,569, Cl. 426-549.000.

Fritzsche Dodge & Olcott Inc.: *See—*
Farbood, Mohamad I.; and Willis, Brian J., 4,560,656, Cl. 435-146.000.

Froehlich, Peter: *See—*
Herb, Armin; and Froehlich, Peter, 4,560,311, Cl. 411-44.000.

Frois, Mauricio; and Leo, Daniel W., to Ledan, Inc. Illuminated sign construction. 4,559,731, Cl. 40-546.000.

Frolov, Alexandr D.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Yamakawa, Toru, 4,560,021, Cl. 180-54.100.

Fuji Kiko Company, Limited: *See—*
Toyama, Hiroshige; Mizuno, Yoshiyuki; Yamamoto, Yoshimi; and Kato, Mitsuru, 4,560,115, Cl. 242-107.40A.

Fuji Oil Company, Limited: *See—*
Narimatsu, Hiroki; Sakamoto, Kenshi; Edayoshi, Tomoko; and Kubota, Hayato, 4,560,560, Cl. 426-38.000.

Fuji Photo Film Co., Ltd.: *See—*
Maeda, Minoru; Inoue, Noriyuki; and Totsuka, Mikio, 4,560,637, Cl. 430-202.000.
Naito, Hideki; and Sato, Kozo, 4,560,644, Cl. 430-351.000.
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,560,616, Cl. 428-423.100.
Sato, Kozo; and Hirai, Hiroyuki, 4,560,763, Cl. 546-341.000.
Toriuchi, Masaharu; and Ono, Shigetoshi, 4,560,645, Cl. 430-562.000.

Fuji Photo Optical Co., Ltd.: *See—*
Doi, Yoshikazu; and Sado, Kenzo, 4,560,254, Cl. 350-427.000.

Fuji Xerox Co., Ltd.: *See—*
Moriguchi, Haruhiko; Inui, Toshiharu; and Ohmori, Takashi, 4,560,988, Cl. 346-1.100.
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.

Fujii, Kiyonobu: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, 4,560,715, Cl. 523-443.000.

Fujimoto, Hideo: *See—*
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,560,625, Cl. 428-654.000.

Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, to Fujimoto Pharmaceutical Corporation. Synthesis of an imidazolyl isothiourea. 4,560,764, Cl. 548-190.000.

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Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,560,764, Cl. 548-190.000.

Fujioka, Yoshiki: *See—*
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, 4,560,927, Cl. 324-166.000.

Fujirebio Kabushiki Kaisha: *See—*
Nakae, Taiji; and Ryo, Eisaku, 4,560,665, Cl. 436-172.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,560,765, Cl. 548-194.000.

Fujishita, Kusuo; and Sakamoto, Hideshi, to Chisso Corporation. Polypropylene fibers having improved heat-shrinkability and tenacity. 4,560,734, Cl. 526-142.000.

Fujita, Yasuhiko: *See—*
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,560,890, Cl. 307-355.000.

Fujitsu Limited: *See—*
Ando, Moritoshi; Mita, Kikuo; and Kakinoki, Yoshikazu, 4,560,273, Cl. 356-237.000.
Satoh, Yoshio; Yanase, Takeyasu; and Komenou, Kazunari, 4,561,069, Cl. 365-36.000.
Yoshida, Masumi; and Masui, Takeshi, 4,561,106, Cl. 382-49.000.

Fujiwara, Kazuyuki: *See—*
Onitsuka, Masaaki; and Fujiwara, Kazuyuki, 4,560,186, Cl. 280-752.000.

Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, to Alps Electric Co. Ltd. Sheet presser mechanism for recorders with pivotable cover plate. 4,560,295, Cl. 400-637.100.

Fujiwara, Mitsuru; and Torigoe, Taisuke, to Hitachi, Ltd. Screw compressor. 4,560,333, Cl. 418-180.000.

Fujiwara, Takashi; and Ishitobi, Tamio, to Asahi Kasei Kogyo Kabushiki Kaisha. Poly(P-phenyleneterephthalamide) fibers. 4,560,743, Cl. 528-348.000.

Fukuchi, Masakazu; Oishi, Keiji; and Iwai, Yasuyuki, to Konishiroku Photo Industry Co., Ltd. Developing unit. 4,559,898, Cl. 118-653.000.

Fukui, Tsutomu; and Shirai, Tomoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Color sign inserting circuit for video signal reproducing system. 4,561,013, Cl. 358-22.000.

Fukushima, Masakazu: *See—*
Takayama, Shigehiko; Maruyama, Masanori; and Fukushima, Masakazu, 4,560,899, Cl. 313-449.000.

Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, to Fujisawa Pharmaceutical Co., Ltd. Clavulone derivatives, process for preparing the same, and use of said compounds. 4,560,703, Cl. 514-530.000.

Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, to Sumitomo Chemical Company, Limited. Plastic film. 4,560,609, Cl. 428-220.000.

Fuller, Robert R.: *See—*
Radford, Kenneth C.; Keller, Herbert W.; Parks, Beryl H.; and Fuller, Robert R., 4,560,462, Cl. 204-298.000.

Fumio, Ohtomo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Optical distance-measuring method and apparatus therefor. 4,560,271, Cl. 356-5.000.

Funabashi, Tadashi, to Pioneer Electronic Corporation. Front loading disc player. 4,561,085, Cl. 369-77.100.

Funakoshi, Satoshi: *See—*
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.

Funakoshi, Takeshi: *See—*
Tani, Masanori; Eto, Shin'ichi; and Funakoshi, Takeshi, 4,560,210, Cl. 303-22.00R.

Funaoka, Chihiro: *See—*
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, 4,560,885, Cl. 307-10.00R.

Funazo, Giichi: *See—*
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,560,764, Cl. 548-190.000.

Funke, Gunther; and Eick, Hans-Joachim, to Kocks Technuk GmbH & Co. Rolling mills. 4,559,799, Cl. 72-224.000.

Fuqua, Debra L.: *See—*
Bruno, David J., Jr.; Dodds, Michael J.; Fuqua, Debra L.; and Hunter, John E., 4,560,564, Cl. 426-250.000.

Furrer, Andreas, to BBC Brown, Boveri & Company Limited. Switching amplifier for digital power amplification. 4,560,944, Cl. 330-10.000.

Furukawa Electric Co., Ltd., The: *See—*
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Fuse, Mario: *See—*
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.

Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,559,901, Cl. 118-723.000.

Futterer, Augustin, to Siemens Aktiengesellschaft. Voltage-controlled oscillator with surface-wave transmission line. 4,560,951, Cl. 331-107.00A.

G. D. Searle & Co.: *See—*
Adelstein, Gilbert W.; and Chorvat, Robert J., 4,560,754, Cl. 544-282.000.

G.D Societa' per Azioni: *See—*
Gamberini, Antonio, 4,559,758, Cl. 53-207.000.

G.T.M.-Entrepose: *See—*
Augoyard, Jean-Pierre, 4,560,424, Cl. 148-150.000.

GA Technologies Inc.: *See—*
Ohkawa, Tihiro, 4,560,528, Cl. 376-121.000.

Gaffney, Anne M., to Atlantic Richfield Company. Hydrocarbon dehydrogenation. 4,560,823, Cl. 585-654.000.

Gagas, Donald F., to Centralab, Inc. Process for silver plating rotary contact assemblies. 4,559,703, Cl. 29-876.000.

Gagnon, Ronald W., to United Technologies Corporation. Magnetic actuator for a gas valve. 4,560,968, Cl. 335-281.000.

Gaines, Larry D.; and Likins, Merle R., Jr., to Phillips Petroleum Company. Boiler control. 4,559,785, Cl. 60-676.000.

Gajria, Chandrasen; and Ozari, Yehuda, to Celanese Corporation. Water-swellable crosslinked polymeric microgel particles and aqueous dispersions of organic film-forming resins containing the same. 4,560,714, Cl. 523-409.000.

Galloway, Roy C.: *See—*
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,560,627, Cl. 429-103.000.

Gamberini, Antonio, to G.D Societa' per Azioni. Cigarette packing machine. 4,559,758, Cl. 53-207.000.

Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., to Zavod-Vtuz Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva; and Moskovskoe Vysshee Tekhnicheskoe Uchilische Imeni N. E. Baumana. Press. 4,559,807, Cl. 72-454.000.

Gandini, Mario: *See—*
Margaroli, Giovanni; and Gandini, Mario, 4,560,225, Cl. 339-97.00C.

Gardner, John F.; and Showalter, Thomas W., to Xomox Corporation. Valve and method of making same. 4,559,967, Cl. 137-340.000.

Garner, John N.; and McGettigan, Philip A., to Northern Telecom Limited. Manufacture of telecommunications cable core units. 4,559,771, Cl. 57-6.000.

Garrett Corporation, The: *See—*
McDonald, George H.; and Manatt, Scott A., 4,560,394, Cl. 55-16.000.
Terp, Leslie S., 4,560,121, Cl. 244-3.220.

Garza, Richard G.; Sayegh, Pinhas; and Bjorklund, James R., to RCA Corporation. Eye-moving mechanism for a figure toy. 4,560,363, Cl. 446-342.000.

Gassett, John D.: *See—*
Bradley, John S., 4,560,503, Cl. 252-633.000.

Geat, Mario; and Dornik, Luciano, to SICIM SpA. Endermic injector device. 4,560,377, Cl. 604-68.000.

Geczy, Bela A., to Smith International, Inc. Thrust bearing assembly for a downhole drill motor. 4,560,014, Cl. 175-107.000.

Gehret, Jean-Claude; and Gubler, Kurt, to Ciba-Geigy Corporation. Pesticidal compositions based on N-pyrrolylphenyl-N'-benzoylurea compounds. 4,560,770, Cl. 548-561.000.

Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, to Hoechst Aktiengesellschaft. Process for the continuous production of 2-carboxyethyl-alkyl-phosphinic acid dialkylesters. 4,560,518, Cl. 260-970.000.

Geirnaert, Gilles, to Argiles & Mineraux AGS-BMP. Fixation support for microorganisms. 4,560,660, Cl. 435-176.000.

Gellatly, William W.: *See—*
Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., 4,560,989, Cl. 346-1.100.

Gellerson, Walter G., to Decoto Aircraft Inc. Device to transfer mechanical motion across fluid barrier. 4,559,865, Cl. 92-5.00L.

General Electric Company: *See—*
Andrews, Edward W.; and Lambert, Thomas W., 4,561,054, Cl. 364-414.000.
Bair, Eugene C.; and Crawford, Delmar E., 4,559,698, Cl. 29-598.000.
Chiu, Norman H., 4,561,002, Cl. 340-365.00C.
DePuy, Robert P., 4,561,047, Cl. 363-56.000.
Hoffman, David M., 4,560,877, Cl. 250-366.000.
Houston, John M., 4,559,790, Cl. 62-259.300.
Mark, Victor; and Hedges, Charles V., 4,560,808, Cl. 568-722.000.
Peil, William, 4,560,909, Cl. 315-291.000.
Sugalski, Raymond K.; and Strickland, John J., 4,559,700, Cl. 29-623.100.
Talley, John J.; Evans, Irene A.; and Lewis, Michael D., 4,560,810, Cl. 568-805.000.
Tyrell, John A., 4,560,722, Cl. 524-405.000.
Vogt, George H.; and Derderian, Scott K., 4,560,896, Cl. 310-215.000.
Welles, Kenneth B., II; and Noujaim, Sharbel E., 4,560,941, Cl. 329-50.000.

General Electric Company, p.l.c., The: *See—*
Homer, Joseph A., 4,560,842, Cl. 179-81.00R.

General Motors Corporation: *See—*
Abu-Isa, Ismat A.; Wang, Chen-Shih; McCarthy, Daniel P.; and Patterson, David W., 4,559,688, Cl. 29-157.30R.
Sell, Jeffrey A.; Capehart, Tenneille W.; and Richter, Roy, 4,560,042, Cl. 188-322.210.

Geophysical Company of Norway A.S.: *See—*
Brands ter, Helge; Ommundsen, Tor A.; and Mjoen, Oyvind, 4,561,073, Cl. 367-19.000.

Georgelin, Alexandre: *See—*
Ballerin, Jean-Paul; Georgelin, Alexandre; and Ballerin, Edmond, 4,559,918, Cl. 124-78.000.

Geotronics AB: *See—*
Wiklund, Klas R.; and Hertzman, Mikael, 4,560,270, Cl. 356-5.000.

Gerard, Jean-Louis; Le Marchand, Claude; and Raguier, Marcel, to Societe Anonyme D.B.A. Disc brake and a pad for such a brake. 4,560,038, Cl. 188-73.380.

Gerard, Jean-Louis; Berthet, Pierre; Bricot, Claude; and Audoin, Michel, to Thomson-CSF. Process and system for optical recording and reading on a mobile data carrier. 4,561,082, Cl. 369-45.000.

Gergely, Gerhard. Apparatus for mixing and granulating powdery substances with a sifting device attached by means of a valve closure. 4,560,282, Cl. 366-134.000.

Gersbach, Klaus: *See—*
Bocker, Jurgen; Klein, Klaus W.; and Gersbach, Klaus, 4,559,876, Cl. 102-520.000.

Gerst, Michael: *See—*
Maack, Werner; Gerst, Michael; and Liedloff, Manfred, 4,559,702, Cl. 29-759.000.

Geweniger, Karl-Otto. Processing plant for treating hides, skins, pieces of leather and the like. 4,559,793, Cl. 69-33.000.

Geyer, Frederick F., to Eastman Kodak Company. Optical write/read unit with selective-transparency cover. 4,561,086, Cl. 369-100.000.

Giacomel, Jeffrey A., to LTV Aerospace and Defense Company. Composite matrix with oriented whiskers. 4,560,603, Cl. 428-86.000.

Giannelli, Raymond; and Martin, Matthew R., to Lumex, Inc. Quickly disengagable lock for adjustably positioned seat. 4,560,200, Cl. 297-346.000.

Gianotti, Giuseppe: *See—*
Bastioli, Catia; Gianotti, Giuseppe; Mattera, Adriano; and Parrini, Paolo, 4,560,522, Cl. 264-41.000.

Gilb, Tyrell T., to Simpson Strong-Tie, Company, Inc. Heavy slope and skew sheet metal hanger and method of making same. 4,560,301, Cl. 403-232.100.

Gill, Hardial S.: *See—*
Tegel, Othmar; and Gill, Hardial S., 4,560,952, Cl. 331-107.0DP.

Gilman, Sol: *See—*
Walker, Charles W., Jr.; Wade, William L., Jr.; Binder, Michael; and Gilman, Sol, 4,560,628, Cl. 429-105.000.

Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, to Blaschim S.p.A. Preparation of esters of 2-(6'-methoxy-2'-naphthyl)-propionic acid via rearrangement of ketals of 2-halo-1-(6'-methoxy-2'-naphthyl)-propan-1-one. 4,560,777, Cl. 549-374.000.

Girard, Theodore A.; and Franklin, Lloyd C., to Glyco Chemicals, Inc. Shaped halogenated hydantoins. 4,560,766, Cl. 548-311.000.

Girod, George F.: *See—*
Rosen, Howard N.; Kent, Albert C.; and Girod, George F., 4,559,823, Cl. 73-338.000.

Gist-Brocades N.V.: *See—*
Heijnen, Joseph J., 4,560,479, Cl. 210-603.000.

Giusti, Glyn R., to T. Giusti & Son Ltd. Apparatus and a process for injecting steam directly into a product in a processing vessel. 4,559,980, Cl. 141-11.000.

Glass, Joe R.: *See—*
Yung, Kenneth K.; Barlow, Craig B.; and Glass, Joe R., 4,560,538, Cl. 423-3.000.

Glatzel, Werner, to Blaupunkt-Werke GmbH. Connection wire alignment or orientation apparatus and method for electrical circuit elements. 4,559,978, Cl. 140-147.000.

Glaverbel: *See—*
Plumat, Robert; Robyn, Pierre; and Deschepper, Pierre, 4,560,591, Cl. 427-422.000.

Glaxo Group Limited: *See—*
Looker, Brian E., 4,560,683, Cl. 514-202.000.

Glotin, Bernard J.: *See—*
Beseme, Jean H.; Corral, Jose R.; and Glotin, Bernard J., 4,559,709, Cl. 33-178.00F.

Glyco Chemicals, Inc.: *See*—
Girard, Theodore A.; and Franklin, Lloyd C., 4,560,766, Cl. 548-311.000.
Godlewski, Edward S. Inking roller assembly. 4,559,873, Cl. 101-329.000.
Goetz, Alexander F. H., to California Institute of Technology. Portable instant display and analysis reflectance spectrometer. 4,560,275, Cl. 356-326.000.
Goetz, Manfred. Ceramic stove. 4,559,923, Cl. 126-307.00R.
Goins, Dixie E.; Huggins, Harold V.; Burt, Edward A.; and Holmes, Silas W., to Ethyl Corporation. Alkylation process. 4,560,809, Cl. 568-789.000.
Goldberger, William M.; and Reed, Allan, to Superior Graphite. Metal bearing graphitic carbons. 4,560,409, Cl. 75-130.00R.
Goldschmidt, Erwin: *See*—
Eirich, Paul; Eirich, Hubert; Eirich, Walter; and Goldschmidt, Erwin, 4,560,283, Cl. 366-188.000.
Golovin, Vasily Y.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Gonterman, J. Ronald: *See*—
Rapp, Charles F.; Fausey, William H.; and Gonterman, J. Ronald, 4,560,606, Cl. 428-141.000.
Gonzales, Don E. Lid adapter for use with a rotating head. 4,560,001, Cl. 166-84.000.
Gonzalez, Mikel: *See*—
Bardina, Juan; and Gonzalez, Mikel, 4,560,417, Cl. 134-1.000.
Gordeev, Nikolai A.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Gordon, Eric M.: *See*—
Weller, Harold N., III; Gordon, Eric M.; and Delaney, Norma G., 4,560,506, Cl. 260-112.50R.
Gorozhankin, Valery N.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Gosling, Ian G.; and Carver, Richard D., to British Telecommunications plc. Mounting dielectric resonators. 4,560,965, Cl. 333-219.000.
Goswami, Jagadish C., to Stauffer Chemical Company. Building/vapor barrier combination. 4,560,618, Cl. 428-500.000.
Grabbe, Dimitry: *See*—
Burns, Carmen; and Grabbe, Dimitry, 4,560,826, Cl. 174-52.0FP.
Grady, James H. Stud and screw rivet fastener. 4,560,312, Cl. 411-55.000.
Graham, Anne M.: *See*—
Attig, Thomas G.; Graham, Anne M.; and Pesa, Frederick, 4,560,672, Cl. 502-183.000.
Graham, Charles R.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,560,674, Cl. 502-209.000.
Granzow, Daniel B.; Luecders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., to Baxter Travenol Laboratories, Inc. Peritoneal dialysis apparatus. 4,560,472, Cl. 210-140.000.
Graphic Controls Corporation: *See*—
Vaughan, Raymond C.; DiSabito, David M.; Mruk, Norbert J.; and Eddy, Arthur R., Jr., 4,559,950, Cl. 128-641.000.
Grasselli, Robert K.: *See*—
Burrington, James D.; Grasselli, Robert K.; Pesa, Fred; and Maher, Elizabeth A., 4,560,730, Cl. 525-340.000.
Harris, Jonathan H.; Tenhover, Michael A.; Grasselli, Robert K.; and Ward, Michael D., 4,560,454, Cl. 204-128.000.
Grassi, Julio J. Door security device. 4,560,191, Cl. 292-264.000.
Grau, Werner: *See*—
Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, 4,560,624, Cl. 428-632.000.
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, 4,560,456, Cl. 204-159.140.
Grazianski, Thomas: *See*—
Baldszun, Karl; Grazianski, Thomas; and Kuhn, Gunther, 4,560,269, Cl. 356-246.000.
Green Cross Corporation, The: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.
Greene, Frederick C.: *See*—
Bonzer, Richard C.; and Greene, Frederick C., 4,559,669, Cl. 16-44.000.
Greene, Richard. Graphic input apparatus. 4,561,017, Cl. 358-93.000.
Greilinger, Friedrich; and Katschinski, Ulrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Continuous casting and rolling device. 4,559,990, Cl. 164-428.000.
Gresens, Harry, to Bruckner Trockentechnik GmbH & Co. Tensioning machine. 4,559,680, Cl. 26-74.000.
Grieshaber, Hermann: *See*—
Flaig, Ulrich; Grieshaber, Hermann; Sieber, Albrecht; and Wietelmann, Jurgen, 4,559,914, Cl. 123-359.000.
Grimm, Hermann; Volz, Wolfgang; Supper, Ottmar; and Pfeiffer, Martin, to Daimler-Benz Aktiengesellschaft. Rod shaped thermometer and method of making same. 4,560,973, Cl. 338-28.000.
Grisar, J. Martin: *See*—
Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, 4,560,700, Cl. 514-423.000.
Grishkov, Andrei M.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Gritsch, Herbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Sonar method and apparatus. 4,561,076, Cl. 367-88.000.
Grolsche Bierbrouwerij B.V.: *See*—
Souren, Hubertus J., 4,560,091, Cl. 222-155.000.
Gross, Laurence H.; and Noshay, Allen, to Union Carbide Corporation. Olefin polymerization catalysts adapted for gas phase processes. 4,560,671, Cl. 502-105.000.
Grossel, Martin C.: *See*—
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.
Grosshandler, Sandor: *See*—
Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., 4,560,452, Cl. 204-98.000.
Grossman, Mark W.: *See*—
Bouchard, Andre C.; and Grossman, Mark W., 4,560,357, Cl. 445-26.000.
Grossmann, Horst; Herting, Rainer; and Kaiser, Horst, to Black & Decker Inc. Indexing arrangement for the table of a chop saw. 4,559,857, Cl. 83-471.300.
Groth, Hugh F.: *See*—
Duncan, L. Scot; Groth, Hugh F.; and Basile, Peter A., 4,559,666, Cl. 15-353.000.
Grundy, Leslie R. Transmission mounting stand. 4,560,151, Cl. 269-17.000.
Grunwald, Werner: *See*—
Frey, Thomas; Grunwald, Werner; Knoll, Gunther; and Weyl, Helmut, 4,560,463, Cl. 204-424.000.
Grychtol, Klaus: *See*—
Baumann, Hans; and Grychtol, Klaus, 4,560,744, Cl. 534-696.000.
GTE Automatic Electric Incorporated: *See*—
Kuster, Karl H., 4,561,046, Cl. 363-21.000.
GTE Communication Systems Corporation: *See*—
Huft, John M., 4,560,834, Cl. 179-16.00F.
GTE Products Corporation: *See*—
Bouchard, Andre C.; and Grossman, Mark W., 4,560,357, Cl. 445-26.000.
Kim, Tai K.; Munn, Robin W.; Boyer, Carl W.; and Vogt, Martin C., 4,560,539, Cl. 423-59.000.
GTI Corporation: *See*—
Emmons, Daniel R.; and Swanson, William E., 4,561,066, Cl. 364-736.000.
Gubler, Kurt: *See*—
Gehret, Jean-Claude; and Gubler, Kurt, 4,560,770, Cl. 548-561.000.
Guidi, Loris: *See*—
Vanni, Sergio; Guidi, Loris; Vallini, Paolo; Pace, Renato C.; and Scotti, Carlo, 4,560,384, Cl. 8-94.210.
Guillerm, Jean: *See*—
Fondronnier, Jacques; Guillerm, Jean; and Comte, Michel, 4,559,987, Cl. 144-213.000.
Guimont, John M.; Manser, Gerald E.; and Ross, Donald L., to United States of America, Air Force. Preparation and polymerization of oxether-1. 4,560,779, Cl. 549-510.000.
Guisinger, Barrett E., to Sony Corporation. Apparatus and method for reading and writing data on a magnetic disc. 4,561,028, Cl. 360-77.000.
Gulf Research & Development Co.: *See*—
Bakshi, Kiran R.; D'Souza, Adrian; and Sabourin, Edward T., 4,560,800, Cl. 568-306.000.
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., 4,560,721, Cl. 524-378.000.
Gumkowski, Bert A.; and Oltmanns, Roger W., Jr., to Allied Corporation. Spring for a disc brake. 4,560,037, Cl. 188-73.380.

Gunn, Michael B.; and Hung, William M., to Hilton-Davis Chemical Co., The. Electrochromic marking systems. 4,561,001, Cl. 346-218.000.

Gupta, Shri P.: *See*—
Regnier, Frederick E.; and Gupta, Shri P., 4,560,704, Cl. 521-31.000.

Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, to BASF Aktiengesellschaft. Magnetic recording media with a dual protective coating of silicon monoxide and chromium. 4,560,624, Cl. 428-632.000.

Guz, Sabahattin: *See*—
Defago, Raymond; and Guz, Sabahattin, 4,560,387, Cl. 8-527.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Static VAR generator having reduced harmonics. 4,560,917, Cl. 323-210.000.

Haarmann, Walter: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; and Hartmann, Hein, 4,560,051, Cl. 192-98.000.

Hackstein, Karl; Hrovat, Milan; Schmidt-Hansberg, Thomas; Rachor, Lothar; and Huschka, Hans, to Nukem GmbH. Molded body for embedding radioactive waste and process for its production. 4,560,502, Cl. 252-628.000.

Hadley, Michael S.; and Blaney, Francis E., to Beecham Group p.l.c. 9-Azabicyclo(3.3.1) nonane intermediates for compounds useful in the treatment of CNS disorders. 4,560,757, Cl. 546-112.000.

Hafele, Robert X., to Hoover Universal, Inc. Apparatus for transporting sectional molds. 4,560,341, Cl. 425-532.000.

Hagen, Rainer: *See*—
Coenen, Hubert; Eggers, Rudolf; and Hagen, Rainer, 4,560,513, Cl. 260-403.000.

Hahn, Norbert, to Rite-Hite Corporation. Vehicle restraint. 4,560,315, Cl. 414-401.000.

Haire, Christopher A. R.: *See*—
Wright, Basil M.; and Haire, Christopher A. R., 4,559,953, Cl. 128-680.000.

Hakoyama, Akiyoshi, to Hitachi, Ltd. Thermal printing method and thermal printer. 4,560,993, Cl. 346-76.0PH.

Halbach and Braun Industrieanlagen: *See*—
Braun, Ernst; and Braun, Gert, 4,560,059, Cl. 198-735.000.

Halcon SD Group, Inc., The: *See*—
Jacobson, Stephen E., 4,560,806, Cl. 568-462.000.

Halder, Prasanta: *See*—
Waldmann, Heinrich; Halder, Prasanta; Volz, Wolfgang; and Stolz, Albert, 4,559,994, Cl. 165-41.000.

Hale, Thomas K.: *See*—
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., 4,559,939, Cl. 128-201.280.

Haley, John E., Jr.; Lynch, Michael J.; and Rosenberg, Jeffrey S., to Halliburton Company. Apparatus and method for monitoring motion of a railroad train. 4,561,057, Cl. 364-436.000.

Halkey-Roberts Corporation: *See*—
Burr, J. Kelsey, 4,560,356, Cl. 441-80.000.

Hall, John B.; Sanders, James M.; and Siano, James N., to International Flavors & Fragrances Inc. Isosolanone and solanone intermediates and organoleptic uses. 4,560,499, Cl. 252-522.00R.

Hall, Nicholas E.: *See*—
Daniels, Ben G.; Hall, Nicholas E.; Naples, Daniel F.; and Schnell, Albert C., 4,559,760, Cl. 53-314.000.

Hall, Patrick L.: *See*—
Olson, Harlan W.; and Hall, Patrick L., 4,559,889, Cl. 114-153.000.

Hall, Richard L., to Westinghouse Electric Corp. Automated soldering process and apparatus. 4,560,100, Cl. 228-40.000.

Hall, Steven E.; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted thio prostaglandin analogs and their use in the treatment in thrombolytic disease. 4,560,698, Cl. 514-469.000.

Hallcher, Richard C.: *See*—
Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., 4,560,775, Cl. 549-326.000.

Halliburton Company: *See*—
Haley, John E., Jr.; Lynch, Michael J.; and Rosenberg, Jeffrey S., 4,561,057, Cl. 364-436.000.
Winslow, Donald W.; and Wray, Gary Q., 4,560,004, Cl. 166-321.000.

Hamano, Junichi, to Takasago Electric Industry Co., Ltd. Image displaying method in a card game machine. 4,560,161, Cl. 273-85.0CP.

Hamano, Toshihisa: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.

Hamberg, Mats: *See*—
Samuelsson, Bengt; Serhan, Charles; and Hamberg, Mats, 4,560,514, Cl. 260-410.000.

Hammack, Teddy J.: *See*—
Horsma, David A.; and Hammack, Teddy J., 4,560,498, Cl. 252-511.000.

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Hamy, Norbert; Nutt, Phillip; and Sheridan, Douglas, to Bata Shoe Company, Inc. Sports shoe. 4,559,723, Cl. 36-102.000.

Han, David C. Fixing tool for square frame. 4,560,153, Cl. 269-42.000.

Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, to Furukawa Electric Co., Ltd., The. Water impervious heat shrinkable tube. 4,559,973, Cl. 138-138.000.

Hanmyo, Masayuki: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.

Hanna, Daniel C. Top nozzle air dryer with counterbalanced motor assembly. 4,559,721, Cl. 34-229.000.

Hansen, Bjorn N., to International Standard Electric Corporation. Digital handsfree telephone. 4,560,840, Cl. 179-81.00B.

Hanson, Colin J. Moisture analyzer. 4,560,923, Cl. 324-61.0QL.

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Hara, Sohichi; and Matsuzaki, Minori, to Aisin Seiki Kabushiki Kaisha. Method of manufacturing a piston for internal combustion engines. 4,559,685, Cl. 29-156.50R.

Harada, Tsuneo: *See*—
Saito, Yu; and Harada, Tsuneo, 4,560,615, Cl. 428-328.000.

Hardenbrook, David L.: *See*—
Doane, John C.; and Hardenbrook, David L., 4,561,093, Cl. 371-20.000.

Harima, Hiroshi: *See*—
Horiguchi, Satoru; and Harima, Hiroshi, 4,561,103, Cl. 382-1.000.

Harke, Elwood W.; Sokolowski, Robert C.; and Johnson, Russell L., to Kimberly-Clark Corporation. Method of making agglomerated cellulosic particles using a substantially horizontal rotating drum. 4,560,527, Cl. 264-500.000.

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Krummacher, Martin W.; Harmon, Lavon A.; and Clipfell, Perry E., 4,559,870, Cl. 100-215.000.

Harmsen, Jan H., to N.V. Nederlandsche Apparatenfabriek Nedap. Feeding box. 4,559,904, Cl. 119-51.00R.

Harrell, Edward R.: *See*—
Millet, George H.; Harrell, Edward R.; and Wright, Charles D., 4,560,723, Cl. 574-486.000.

Harris Corporation: *See*—
Patel, Vipin N., 4,560,422, Cl. 148-33.000.
Prentice, John S.; and Cotreau, Gerald M., 4,560,948, Cl. 330-282.000.

Harris, David L.; and Taylor, Colin, to Foundry Automation, Inc. Foundry apparatus for mixing sand with binder. 4,560,281, Cl. 366-15.000.

Harris, Jonathan H.; Tenhover, Michael A.; Grasselli, Robert K.; and Ward, Michael D., to Standard Oil Company (Ohio), The. Electrolysis of halide-containing solutions with platinum based amorphous metal alloy anodes. 4,560,454, Cl. 204-128.000.

Harris, Michael D., to Perkin-Elmer Corporation, The. Three-axis angle sensor. 4,560,272, Cl. 356-138.000.

Harrison, James M., to Texstyrene Plastics, Inc. Impregnating polystyrene beads with an expanding agent. 4,560,705, Cl. 521-60.000.

Hartmann, Hein: *See*—
Brandenstein, Manfred; Haas, Roland; and Hartmann, Hein, 4,560,051, Cl. 192-98.000.

Hase, Yoshifumi: *See*—
Nagumo, Shinichi; Hase, Yoshifumi; and Sanezawa, Fumio, 4,560,104, Cl. 236-34.500.

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Tsujimoto, Michihiro; Asano, Makoto; Hasegawa, Kiyoharu; and Akahori, Hiroyuki, 4,561,000, Cl. 346-208.000.

Hasegawa, Yukio: *See*—
Kijima, Nobuo; and Hasegawa, Yukio, 4,559,895, Cl. 116-200.000.

Hashimoto, Hiroshi: *See*—
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,560,616, Cl. 428-423.100.

Hashimoto, Noriaki; Kubo, Kanji; and Izumi, Chikahiko, to Hitachi, Ltd. Storage system having buffer storage. 4,561,071, Cl. 365-230.000.

Hashimoto, Teiji, to Canon Kabushiki Kaisha. Blade type focal plane shutter. 4,560,265, Cl. 354-246.000.

Hashimoto, Tokuo: *See*—
Ikegaki, Makoto; Nakanishi, Masayuki; Sato, Humiyuki; and Hashimoto, Tokuo, 4,560,900, Cl. 313-479.000.

Hashimoto, Yasuyuki: *See*—
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, 4,560,054, Cl. 192-106.200.

Hashiya, Ikuo: *See*—
Nagamoto, Mitsuki; and Hashiya, Ikuo, 4,560,966, Cl. 335-80.000.

Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for producing terephthalic acid. 4,560,793, Cl. 562-414.000.

Haskin, Helen K.: *See*—
Davis, Lorne A., Jr.; and Haskin, Helen K., 4,560,002, Cl. 166-252.000.

Haslanger, Martin F.: *See*—
Hall, Steven E.; and Haslanger, Martin F., 4,560,698, Cl. 514-469.000.

Hata, Shun-ichi: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Hatton, John S.; Clarke, Roland N.; and Saini, Raj K., to W & T Avery Limited. Transducers. 4,561,038, Cl. 361-280.000.

Hattori, Masaaki: *See*—
Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, 4,560,713, Cl. 523-400.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Belt type continuous reduction gear mechanism. 4,560,369, Cl. 474-28.000.
Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. V-belt power transmission. 4,560,370, Cl. 474-201.000.
Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. V-belt transmission apparatus. 4,560,371, Cl. 474-201.000.
Haug, Walter; and Zambelli, Hans D., to Karl Kassbohrer Fahrzeugwerke BmbH. Apparatus for forming cross country skiing tracks in a snow covered surface. 4,560,303, Cl. 404-118.000.
Haug, Walter: *See*—
Wieland, Erwin H.; and Haug, Walter, 4,559,725, Cl. 37-197.000.
Hausser, Horst, to Horst Hausser Metallwaren GmbH. Height adjustable work plate. 4,559,879, Cl. 108-136.000.
Hayashi, Mitsuji: *See*—
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,561,045, Cl. 362-368.000.
Hayashi, Motohiko; Karita, Toshiaki; Kotani, Matahira; and Sasaki, Hiromu, to Sharp Kabushiki Kaisha. Image recording arrangement. 4,560,992, Cl. 346-76.0PH.
Hayashi, Takehiko; Ikuta, Hiroyuki; and Shindo, Toshiki, to Toyoda Koki Kabushiki Kaisha. Fillet rolling machine. 4,559,798, Cl. 72-81.000.
Hayashi, Yasunori, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic clear circuit. 4,560,889, Cl. 307-290.000.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Load responsive temperature control arrangement for internal combustion engine. 4,559,907, Cl. 123-41.120.
Hayatsu, Kazuo: *See*—
Ueno, Katsuji; Sugimoto, Hiroaki; and Hayatsu, Kazuo, 4,560,740, Cl. 528-125.000.
Hayes, David: *See*—
Downing, Jack G.; Dewald, Erwin W.; and Hayes, David, 4,560,071, Cl. 211-70.800.
Haytayan, Harry M., to Pneutek, Inc. Powder charge feed strip. 4,560,061, Cl. 206-3.000.
Hayward, Ian, to British Gas Corporation. Velocity or distance measuring apparatus using magnetic dipoles. 4,560,928, Cl. 324-172.000.
Hazenbroek, Jacobus E.; and Wallbridge, William L. Poultry cut-up machine. 4,559,672, Cl. 17-11.000.
Heckmann, Walter: *See*—
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.
Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,560,808, Cl. 568-722.000.
Hefner, Robert E., Jr.; and Hunter, Douglas L., to Dow Chemical Company, The. Polyimido-ester compounds and thermoset resin compositions containing same. 4,560,768, Cl. 548-435.000.
Heiberger, Ernst; and Heiberger, Franz. Machine for vibratory grinding of workpieces. 4,559,742, Cl. 51-163.100.
Heiberger, Franz: *See*—
Heiberger, Ernst; and Heiberger, Franz, 4,559,742, Cl. 51-163.100.
Heichlinger, Norbert: *See*—
Heinrich, Karl; Heichlinger, Norbert; and Donig, Adolf, 4,559,772, Cl. 57-247.000.
Heijnen, Joseph J., to Gist-Brocades N.V. Process for preparing biomass attached to a carrier. 4,560,479, Cl. 210-603.000.
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, to BASF Aktiengesellschaft. Magnetic recording media. 4,560,456, Cl. 204-159.140.
Heilmann, Peter: *See*—
Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, 4,560,624, Cl. 428-632.000.
Heimke, Gunther: *See*—
Schulte, Willi; and Heimke, Gunther, 4,560,353, Cl. 433-173.000.
Hein-Werner Corporation: *See*—
Eck, Leonard F., 4,560,131, Cl. 248-352.000.
Heindl, Alfons: *See*—
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,560,375, Cl. 604-9.000.
Heinrich H. Klussendorf GmbH & Co. KG: *See*—
Wingerter, Franz, 4,559,958, Cl. 133-4.00A.
Heinrich, Karl; Heichlinger, Norbert; and Donig, Adolf, to Hoechst Aktiengesellschaft. False twist texturized yarn, and a process for its preparation. 4,559,772, Cl. 57-247.000.
Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,791, Cl. 560-254.000.
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,802, Cl. 568-388.000.
Heinz, Altmann: *See*—
Dietrich, Demus; Horst, Zaschke; Heinz, Altmann; and Michael, Keil, 4,560,496, Cl. 252-299.610.
Heinzelmann, Karl-Georg: *See*—
Forster, Helmut; Siebold, Horst; and Heinzelmann, Karl-Georg, 4,560,933, Cl. 324-319.000.
Helderle, Paul M.; Arnaud, Fabrice R.; and Le Nours, Yannick, to Compagnie Francaise des Petroles. Sliding-sleeve valve for an oil well. 4,560,005, Cl. 166-332.000.
Helfman, Barbara. Top sider planter. 4,559,738, Cl. 47-66.000.
Heller, Isabelle; and Loewenstein, Paul, to Enertec. Method for determining the direction of the origin of a disturbance affecting an element of an electrical energy transfer network. 4,560,922, Cl. 324-52.000.
Hemond, Robert F., to Lear Siegler, Inc. Tote director. 4,561,060, Cl. 364-478.000.
Hempel, Jurgen. Sealing sleeve with a connecting sleeve for the liquid and/or gastight mounting on a connecting stub. 4,560,178, Cl. 277-212.0FB.
Henderson, Charles J.; and Cotton, Gerald L., to Betteravia Byproducts Co. Poultry feed supplement and method of making. 4,560,561, Cl. 426-74.000.
Henderson, James W.: *See*—
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., 4,560,974, Cl. 340-146.200.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Scharf, Rolf; Koch, Ferdinand; and Schlussler, Hans-Joachim, 4,560,493, Cl. 252-174.160.
Vom Hofe, Dieter; and Meyer, Klaus, 4,560,085, Cl. 220-465.000.
Hennenfent, Douglas J.: *See*—
Kracke, Alan G.; Hennenfent, Douglas J.; and Holmstrand, Allan L., 4,559,743, Cl. 51-165.00R.
Henning, Walter. Axially telescopic coil carrier parallel to each other. 4,560,116, Cl. 242-118.110.
Henninger, Albert S., to Universal Instruments Corporation. Method and apparatus for applying solder masking to a circuit board. 4,560,584, Cl. 427-96.000.
Henze, Herbert O.: *See*—
Weber, John A.; and Henze, Herbert O., 4,560,118, Cl. 242-215.000.
Herald, Cherry L.: *See*—
Pettit, George R.; and Herald, Cherry L., 4,560,774, Cl. 549-267.000.
Herb, Armin; and Froehlich, Peter, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,560,311, Cl. 411-44.000.
Herbert, James F., to Metal Closures Limited. Capping machines for containers. 4,559,759, Cl. 53-308.000.
Herbert Kannegiesser GmbH & Co.: *See*—
Inselmann, Jurgen, 4,560,431, Cl. 156-359.000.
Herbert, Reinhold, to Fresenius AG. Bag for the storage of liquids. 4,561,110, Cl. 383-128.000.
Herchenbach, Paul: *See*—
Vollmer, Jurgen; and Herchenbach, Paul, 4,560,300, Cl. 403-11.000.
Hercules Inc.: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,560,340, Cl. 425-526.000.
Herder, Kornelis, to Wavin B.V. Web of plastic bags. 4,561,107, Cl. 383-37.000.
Herold, Wolf-Dietrich: *See*—
Neumeister, Alexander; and Herold, Wolf-Dietrich, 4,560,352, Cl. 433-90.000.
Herrington, Fox J., to Mobil Oil Corporation. Plastic bags with releasable closure which resists opening from inside. 4,561,109, Cl. 383-65.000.
Herron, Matthew A., to Design Loft, Inc. Wheelchair operated by hand pedalled reciprocating motion. 4,560,181, Cl. 280-242.0WC.
Herting, Rainer: *See*—
Grossmann, Horst; Herting, Rainer; and Kaiser, Horst, 4,559,857, Cl. 83-471.300.
Hertzman, Mikael: *See*—
Wiklund, Klas R.; and Hertzman, Mikael, 4,560,270, Cl. 356-5.000.
Hess, Dale N., to International Telephone and Telegraph Corporation. Supporting apparatus for pipelines systems. 4,560,125, Cl. 248-55.000.
Hesse, Anton: *See*—
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.
Heybourn, Frank: *See*—
Applegate, Barry G.; Carter, David C. M.; and Heybourn, Frank, 4,560,057, Cl. 198-347.000.
Hi-Shear Corporation: *See*—
Olander, Donald E.; and Hyyppa, Juho (said Donald E. Olander assors. to), 4,560,425, Cl. 149-19.910.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, to Asahi Kasei Kogyo Kabushiki Kaisha; and Hidaka, Hiroyoshi. Isoquinolinesulfonyl derivatives which possess a relaxatory action. 4,560,755, Cl. 544-363.000.
Hidaka, Ryoichi: *See*—
Ikehara, Yasunobu; Ariyoshi, Haruki; and Hidaka, Ryoichi, 4,560,406, Cl. 75-30.000.
Hidaka, Toshio: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.
Hidaka, Yoshiaki: *See*—
Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, 4,559,910, Cl. 123-195.00R.
Hidroben S.p.A. Componenti ed Impianti Oleodinamici: *See*—
Mor, Pietro, 4,559,844, Cl. 74-471.00R.
Hien, Rochus; Weigel, Wolfgang; and Vierling, Horst, to Eltro GmbH. Method and apparatus for scanning radiated energy using a single mirror with a plurality of pivotal positions. 4,560,869, Cl. 250-235.000.
Higgs, Kenneth O.; and Everett, Jimmy D., to Texaco Inc. Consistometer. 4,559,811, Cl. 73-59.000.
Higuchi, Hideyo: *See*—
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, 4,561,096, Cl. 372-46.000.
Higuchi, Yasumitsu: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.
Hill, Edward B. Bone plugging apparatus. 4,559,936, Cl. 128-92.00R.

Hill-Rom Company, Inc.: *See*—
Foster, L. Dale, 4,559,656, Cl. 5-236.00R.
Peck, William, 4,559,655, Cl. 5-66.000.
Hilti Aktiengesellschaft: *See*—
Herb, Armin; and Froehlich, Peter, 4,560,311, Cl. 411-44.000.
Hilton, Charles B.: *See*—
Davenport, Kenneth G.; and Hilton, Charles B., 4,560,789, Cl. 560-142.000.
Hilton-Davis Chemical Co., The: *See*—
Gunn, Michael B.; and Hung, William M., 4,561,001, Cl. 346-218.000.
Rebhahn, Robert W. J.; and Cook, Wayne L., 4,560,746, Cl. 534-840.000.
Hiniker Company: *See*—
Peterson, Richard L.; Johnson, James A.; Scheurer, Roger J.; and Steinberg, Richard W., 4,560,011, Cl. 172-194.000.
Hinkel, Jerald J., to Dow Chemical Company, The. Breaker system for high viscosity fluids. 4,560,486, Cl. 252-8.55R.
Hinrichs, Richard J.; and Thuen, Judy, to Applied Polymer Technology, Inc. Method for determining resin viscosity with ultrasonic waves. 4,559,810, Cl. 73-54.000.
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Strainer device for rotary compressor. 4,560,329, Cl. 418-47.000.
Hirai, Hiroyuki: *See*—
Sato, Kozo; and Hirai, Hiroyuki, 4,560,763, Cl. 546-341.000.
Hirai, Osamu: *See*—
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.
Hiraki, Shunichi: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,560,642, Cl. 430-313.000.
Hiramatsu, Akira: *See*—
Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, 4,560,263, Cl. 354-195.100.
Hirano, Ryoichi: *See*—
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Hirano, Takashi, to Yamato Scale Company, Limited. Controlled chute device. 4,559,981, Cl. 141-83.000.
Hiratani, Kazuhisa, to Director-General of Agency of Industrial Science-Technology. Cation carrier. 4,560,759, Cl. 546-178.000.
Hirayama, Kazuo: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.
Hirayama, Takeshi; Amano, Matsuo; Sasayama, Takao; and Baba, Shirou, to Hitachi, Ltd. Electronic control apparatus for internal combustion engine. 4,561,056, Cl. 364-431.050.
Hirohara, Toshihide: *See*—
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, 4,561,044, Cl. 362-84.000.
Hiroki, Ohta; Masatsugu, Oda; and Jun, Kato, to Mitsubishi Chemical Industries Ltd. Organophosphoric acid esters of benzofuranols and pesticidal compositions thereof. 4,560,682, Cl. 514-100.000.
Hiromae, Yoshitaka: *See*—
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Hiromae, Yoshitaka, 4,560,423, Cl. 148-111.000.
Hirsch, Kenneth S.; Jones, Charles D.; Taylor, Harold M.; and Winter, Mark A., to Eli Lilly and Company. Isoxazolyl and isothiazolyl aromatase inhibitors. 4,560,695, Cl. 514-372.000.
Hirschberg, Jakub, to Siemens Aktiengesellschaft. Transport device for individual sheets to be combined into a stack. 4,560,157, Cl. 271-126.000.
Hishida, Hiroaki: *See*—
Arai, Sakuji; Sato, Katsuaki; Kochi, Susumu; and Hishida, Hiroaki, 4,559,776, Cl. 60-280.000.
Hitachi, Ltd.: *See*—
Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, 4,560,404, Cl. 75-0.50C.
Fujiwara, Mitsuru; and Torigoe, Taisuke, 4,560,333, Cl. 418-180.000.
Hakoyama, Akiyoshi, 4,560,993, Cl. 346-76.0PH.
Hashimoto, Noriaki; Kubo, Kanji; and Izumi, Chikahiko, 4,561,071, Cl. 365-230.000.
Hirayama, Takeshi; Amano, Matsuo; Sasayama, Takao; and Baba, Shirou, 4,561,056, Cl. 364-431.050.
Kobayashi, Yukio; Yamaguchi, Kinya; and Kira, Masaki, 4,560,633, Cl. 429-213.000.
Kokaku, Yuuichi; Kitoo, Makoto; and Honda, Yoshinori, 4,560,641, Cl. 430-312.000.
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, 4,561,010, Cl. 357-74.000.
Satake, Mitsuo; and Toyota, Shigekata, 4,561,084, Cl. 369-75.200.
Sato, Kanemasa; and Ueno, Sadayasu, 4,559,814, Cl. 73-118.000.
Takayama, Shigehiko; Maruyama, Masanori; and Fukushima, Masakazu, 4,560,899, Cl. 313-449.000.
Tamura, Hifumi; Okano, Hiroshi; Ishitani, Tohru; and Shimase, Akira, 4,560,907, Cl. 315-111.010.
Yoh, Kanji; Yamashiro, Osamu; and Meguro, Satoshi, 4,559,694, Cl. 29-571.000.
Yoshida, Toshimi; Nakata, Kiyotomo; Masaoka, Isao; and Itow, Hisawo, 4,560,407, Cl. 75-128.00N.
Yoshioka, Masahiro; Mizumoto, Muneo; and Yamada, Koichiro, 4,560,325, Cl. 417-407.000.
Hitachi Maxell Ltd.: *See*—
Akahane, Naoto; Yamaguchi, Yoshitake; Matsuura, Takeshi; and Watatani, Seiji, 4,561,034, Cl. 360-134.000.
Hitachi Shipbuilding & Engineering Co., Ltd.: *See*—
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,559,888, Cl. 114-74.00R.
Hitachi Video Engineering: *See*—
Satake, Mitsuo; and Toyota, Shigekata, 4,561,084, Cl. 369-75.200.
Hitchcock, James R., Jr.: *See*—
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.
Hitomi, Masuo: *See*—
Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, 4,560,415, Cl. 106-286.300.
Hobart Corporation: *See*—
Meyers, Theodore F., 4,559,959, Cl. 134-56.00D.
Hodge, Michaela W.; and Hodge, Robert J. Indexing overlay for video display devices. 4,559,705, Cl. 33-1.00B.
Hodge, Robert J.: *See*—
Hodge, Michaela W.; and Hodge, Robert J., 4,559,705, Cl. 33-1.00B.
Hoechst Aktiengesellschaft: *See*—
Bouchee, Bernhard, 4,560,535, Cl. 422-102.000.
Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,560,518, Cl. 260-970.000.
Heinrich, Karl; Heichlinger, Norbert; and Donig, Adolf, 4,559,772, Cl. 57-247.000.
Monzer, Helmut, 4,560,277, Cl. 356-357.000.
Moraw, Roland; Unger, Manfred; and Walter, Helmut, 4,560,426, Cl. 156-64.000.
Stahlhofen, Paul, 4,560,636, Cl. 430-165.000.
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Martin, Lawrence L.; and Setescak, Linda L., 4,560,701, Cl. 514-443.000.
Hoefer, Peter S., to Hoefer Scientific Instruments. Vertical gel sandwich for use in electrophoresis and method therefor. 4,560,459, Cl. 204-182.800.
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Hoegerle, Karl; and Tobler, Hans, to Ciba Geigy Corporation. 2,4-Diamo-5-(alkylsulfinyl) or alkylsulphonyl)-6-halopyrimidines. 4,560,402, Cl. 71-092.000.
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fouquet, Gerd, to BASF Aktiengesellschaft. Preparation of dienes by dehydration of aldehydes. 4,560,822, Cl. 585-606.000.
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Deppe, Gerd-Joachim; Ettwig, Hans H.; Schneider, Heinz; and Hof, Wolfram, 4,559,819, Cl. 73-159.000.
Hofer, Bruce E., to Tektronix, Inc. State variable oscillator having improved rejection of leveler-induced distortion. 4,560,958, Cl. 331-135.000.
Hoff, H. Milton, to J. M. Huber Corporation. Inverted cone stuffing box. 4,560,176, Cl. 277-105.000.
Hoffend, Thomas R.; and Barbetta, Angelo J., to Xerox Corporation. Toner compositions with ammonium sulfate charge enhancing additives. 4,560,635, Cl. 430-106.600.
Hoffgen, Hans. Gas bubble brick for metallurgical vessels. 4,560,149, Cl. 266-220.000.
Hoffman, David M., to General Electric Company. Solid state detector module. 4,560,877, Cl. 250-366.000.
Hoffman, James E.; and Batzold, John S., to Exxon Research and Engineering Co. Efficient, safe method for decoppering copper refinery electrolyte. 4,560,453, Cl. 204-106.000.
Hoffmann, Alexander: *See*—
Pusch, Gunter; Hoffmann, Alexander; and Aisslinger, Dieter E., 4,560,608, Cl. 428-196.000.
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Field, George F.; and Zally, William J., 4,560,692, Cl. 514-313.000.
Stocker, John, 4,560,647, Cl. 435-5.000.
Hogan, Leroy. Adjustable barbecue rack. 4,559,869, Cl. 99-426.000.
Hogan, Robert J.: *See*—
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., 4,560,468, Cl. 208-110.000.
Hok, Bertil: *See*—
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,560,868, Cl. 250-227.000.
Hokama, Yosh. Cuticle pusher. 4,559,957, Cl. 132-73.000.
Hokari, Hiroshi: *See*—
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Holik, Herbert, to Escher Wyss GmbH. Flotation apparatus for floating fiber suspensions extracted from waste paper. 4,560,474, Cl. 210-221.200.
Hollander, Orin, to Betz Laboratories, Inc. Method of controlling iron induced fouling in water systems. 4,560,481, Cl. 210-697.000.
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DeWoody, Robert O.; and Hollerich, Ralph M., 4,560,033, Cl. 188-2.00F.

Hollister, James: *See—*
Koblasz, Arthur; Hollister, James; and Alexander, Douglas, 4,559,979, Cl. 141-9.000.
Holloway, David G.: *See—*
Massey, Roger G.; and Holloway, David G., 4,559,966, Cl. 137-270.000.
Holmes, Silas W.: *See—*
Goins, Dixie E.; Huggins, Harold V.; Burt, Edward A.; and Holmes, Silas W., 4,560,809, Cl. 568-789.000.
Holmstrand, Allan L.: *See—*
Kracke, Alan G.; Hennenfent, Douglas J.; and Holmstrand, Allan L., 4,559,743, Cl. 51-165.00R.
Homer, Joseph A., to General Electric Company, p.l.c., The. Telecommunication system loop-back unit. 4,560,842, Cl. 179-81.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Arai, Sakuji; Sato, Katsuaki; Kochi, Susumu; and Hishida, Hiroaki, 4,559,776, Cl. 60-280.000.
Hattori, Torao, 4,560,369, Cl. 474-28.000.
Hattori, Torao, 4,560,370, Cl. 474-201.000.
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Honda, Shoich; Muto, Osamu; and Shirakura, Masaru, 4,559,909, Cl. 123-90.280.
Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, 4,560,198, Cl. 296-185.000.
Nonaka, Toshihiko; and Toda, Tetsuo, 4,559,868, Cl. 98-2.080.
Toyama, Shozo; and Yatabe, Fumio, 4,559,917, Cl. 123-571.000.
Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, 4,559,910, Cl. 123-195.00R.
Uchibaba, Kouichi; Takahashi, Hirotake; and Uchiyama, Chiyomitsu, 4,560,049, Cl. 192-85.00R.
Yanagisawa, Yasuhisa; and Tsukiji, Yasuhiko, 4,560,026, Cl. 180-287.000.
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, to SS Pharmaceutical Co., Ltd. Phenylacetic ester derivatives and process for preparing the same. 4,560,785, Cl. 560-52.000.
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Honda, Yoshinori: *See—*
Kokaku, Yuuichi; Kitoo, Makoto; and Honda, Yoshinori, 4,560,641, Cl. 430-312.000.
Honeywell Inc.: *See—*
Bohan, John E., Jr., 4,560,343, Cl. 431-66.000.
Martin, Ronald J., 4,561,104, Cl. 382-8.000.
Servaes, Donald A.; and Reynolds, George O., 4,560,235, Cl. 350-96.240.
Honeywell Information Systems, Inc.: *See—*
Crawford, Knute S., 4,561,053, Cl. 364-200.000.
Hongu, Tatsuhiko: *See—*
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,560,589, Cl. 427-249.000.
Hood, Robert B., to Lodec, Inc. Vehicle platform scale. 4,560,017, Cl. 177-211.000.
Hoover, Merwin F.; Reilly, Phillip B.; Salamone, Ann B.; and Vandebult, Jan, to Polyonics Corporation. Continuous process for fabricating metallic patterns on a thin film substrate. 4,560,445, Cl. 204-15.000.
Hoover Universal, Inc.: *See—*
Hafele, Robert X., 4,560,341, Cl. 425-532.000.
Hopf, Heinrich: *See—*
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,560,724, Cl. 524-734.000.
Hopkins, P. Donald; Nevitt, Thomas D.; and Unmuth, Eugene E., to Standard Oil Company (Indiana). Catalytic dewaxing process. 4,560,469, Cl. 208-110.000.
Hopkins, Tony A.; and Seitz, Rudolf, to Sandoz Ltd. One-bath method for producing tone-in-tone dyeings on sueded wool- or fur-bearing skins. 4,560,386, Cl. 8-437.000.
Hopper, Chester S.: *See—*
Case, Edward M.; and Hopper, Chester S., 4,559,862, Cl. 87-1.000.
Horiguchi, Satoru; and Harima, Hiroshi, to Dai Nippon Insatsu Kabushiki Kaisha. Print inspecting method and apparatus. 4,561,103, Cl. 382-1.000.
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, to BASF Aktiengesellschaft. Polyisocyanurate/polyurethane elastomers based on suspensions of crystalline polyesters and polyhydroxyl compounds. 4,560,708, Cl. 521-137.000.
Hornsby, Carlton R., to Oilgear Company, The. Two tooth tapered reamer. 4,560,309, Cl. 408-229.000.
Horsma, David A.; and Hammack, Teddy J., to Raychem Corporation. Positive temperature coefficient of resistance compositions. 4,560,498, Cl. 252-511.000.
Horst Hausser Metallwaren GmbH: *See—*
Hausser, Horst, 4,559,879, Cl. 108-136.000.
Horst, Zaschke: *See—*
Dietrich, Demus; Horst, Zaschke; Heinz, Altmann; and Michael, Keil, 4,560,496, Cl. 252-299.610.
Horwitz, Lawrence B.: *See—*
Rouse, Donald W.; and Horwitz, Lawrence B., 4,561,089, Cl. 370-18.000.
Hosking, Steven M.; and Dixon, Christopher J., to De La Rue Systems Limited. Sheet feeding apparatus with sheet separator. 4,560,155, Cl. 271-11.000.
Hosoe, Kazuya: *See—*
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, 4,560,864, Cl. 250-201.000.
Hosogaya, Kazuyoshi: *See—*
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,559,888, Cl. 114-74.00R.
Hosoi, Atsushi: *See—*
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.
House Food Industrial Company Limited: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,559,963, Cl. 137-1.000.
Houston, John M., to General Electric Company. Apparatus for maintaining electronic equipment and the like at low temperatures in hot ambient environments. 4,559,790, Cl. 62-259.300.
Howarth, Thomas T.: *See—*
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,560,552, Cl. 424-114.000.
Howell, W. Max: *See—*
Crawford, James I.; and Howell, W. Max, 4,560,120, Cl. 244-3.220.
Hoya Corporation: *See—*
Yoshida, Masahiro; and Nakagawa, Kenji, 4,560,666, Cl. 501-5.000.
Hrovat, Milan: *See—*
Hackstein, Karl; Hrovat, Milan; Schmidt-Hansberg, Thomas; Rachor, Lothar; and Huschka, Hans, 4,560,502, Cl. 252-628.000.
Hseu, Victor C., to Hyman Products Co., Inc. Massage device. 4,559,929, Cl. 128-33.000.
Hsieh, Der-Chang: *See—*
Niven, Jeffrey E.; and Hsieh, Der-Chang, 4,560,925, Cl. 324-97.000.
Huber, Guntram. Installation for storing non-needed belt lock parts coordinated to a motor vehicle back seat. 4,560,203, Cl. 297-481.000.
Hudgens, Claude R., to United States of America, Energy. Rigid indented cylindrical cathode for X-ray tube. 4,560,897, Cl. 313-337.000.
Huebotter, Paul R.; and McLennan, George A., to United States of America, Energy. Fast reactor power plant design having heat pipe heat exchanger. 4,560,533, Cl. 376-367.000.
Huft, John M., to GTE Communication Systems Corporation. Current limiter circuit for battery feed in a telephone circuit. 4,560,834, Cl. 179-16.00F.
Huggins, Harold V.: *See—*
Goins, Dixie E.; Huggins, Harold V.; Burt, Edward A.; and Holmes, Silas W., 4,560,809, Cl. 568-789.000.
Hughes Aircraft Company: *See—*
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., 4,560,974, Cl. 340-146.200.
Knauer, Wolfgang; and Perkins, Walter E., Jr., 4,560,878, Cl. 250-396.00R.
Hughes Helicopters, Inc.: *See—*
Cohen, Edwin E., 4,560,364, Cl. 464-30.000.
Hughes Tool Company-USA: *See—*
Atkinson, Gerald O., 4,559,852, Cl. 76-108.00A.
Hulejczuk, Roman A.: *See—*
Molloy, James O.; Sydenham, Peter E.; and Hulejczuk, Roman A., 4,560,007, Cl. 169-54.000.
Hume, Christopher: *See—*
Eddleston, Michael J.; and Hume, Christopher, 4,560,079, Cl. 220-4.00R.
Humphrey Instruments, Inc.: *See—*
Humphrey, William E., 4,560,259, Cl. 351-211.000.
Humphrey, William E., to Humphrey Instruments, Inc. Objective refractor for the eye. 4,560,259, Cl. 351-211.000.
Hung, William M.: *See—*
Gunn, Michael B.; and Hung, William M., 4,561,001, Cl. 346-218.000.
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, to Elektroschmelzwerk Kempten GmbH. Substantially pore-free shaped articles of polycrystalline silicon carbide, and a process for their manufacture by isostatic hot-pressing. 4,560,668, Cl. 501-92.000.
Hunter, Douglas L.: *See—*
Hefner, Robert E., Jr.; and Hunter, Douglas L., 4,560,768, Cl. 548-435.000.
Hunter, Iain: *See—*
Craig, Robert L.; Hunter, Iain; and Packard, Paul D., 4,561,063, Cl. 364-559.000.
Hunter, John E.: *See—*
Bruno, David J., Jr.; Dodds, Michael J.; Fuqua, Debra L.; and Hunter, John E., 4,560,564, Cl. 426-250.000.
Hunter, Kelvin H., Jr., to Paralyzed Veterans of America. Power operated wheelchair ramp. 4,559,659, Cl. 14-71.300.
Huntington, Morgan G. Aircraft potential of wing lift instrument and method. 4,559,822, Cl. 73-178.00R.
Huschka, Hans: *See—*
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Husky Corporation: *See—*
Fink, Arthur C., Jr., 4,559,982, Cl. 141-206.000.
Hutschenreuther AG: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,560,336, Cl. 425-78.000.
Hydril Company: *See—*
De Boynton, William L.; Lee, Frederick C.; Wilson, Bruce E.; and O'Rourke, John F., 4,559,711, Cl. 33-199.00R.
Hyman Products Co., Inc.: *See—*
Hseu, Victor C., 4,559,929, Cl. 128-33.000.

Hyyppa, Juho: *See*—
Olander, Donald E.; and Hyyppa, Juho, 4,560,425, Cl. 149-19.910.
Ibanez, Paul; Stoessel, John; and Barrett, Donald C., to Anco Engineers, Incorporated. Method and apparatus for measuring the weight of a vehicle while the vehicle is in motion. 4,560,016, Cl. 177-210.00R.
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, to Director-General of Agency of Industrial Science & Technology; and Sanbo Chemical Industries Co., Ltd. Photosensitive high polymer, easily insolubilized when cross-linked by light, a method for preparation thereof, and a composition thereof. 4,560,640, Cl. 430-280.000.
Ichikawa, Katsutoshi: *See*—
Oki, Takeo; and Ichikawa, Katsutoshi, 4,560,298, Cl. 401-107.000.
Ichikawa, Matsuo, to Kabushiki Kaisha Suwa Seikosha. Method of preparing a semiconductor device. 4,560,582, Cl. 427-88.000.
Ichikawa, Toshiji: *See*—
Aoyagi, Juuro; Ichikawa, Toshiji; Koide, Mikio; and Shimomura, Takeshi, 4,560,720, Cl. 524-288.000.
Igersheim, Francoise: *See*—
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,560,801, Cl. 568-362.000.
Iguchi, Hideaki; Sakai, Takayoshi; and Ohashi, Hajime, to Yamazaki Machinery Works, Ltd. Method of determining coordinate system in machining center. 4,561,050, Cl. 364-167.000.
Ihara Chemical Industry Co., Ltd.: *See*—
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.
IHC Holland N.V.: *See*—
Brekelmans, Henricus J. P. M., 4,559,813, Cl. 73-61.400.
Ikeda, Hiroki: *See*—
Arakawa, Takeshi; and Ikeda, Hiroki, 4,561,072, Cl. 365-230.000.
Ikegaki, Makoto; Nakanishi, Masayuki; Sato, Humiyuki; and Hashimoto, Tokuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Cathode ray tube device with electromagnetic shield casing. 4,560,900, Cl. 313-479.000.
Ikehara, Yasunobu; Ariyoshi, Haruki; and Hidaka, Ryoichi, to Nippon Steel Corporation. Process for refining of chromium-containing molten steel. 4,560,406, Cl. 75-30.000.
Ikuta, Hiroyuki: *See*—
Hayashi, Takehiko; Ikuta, Hiroyuki; and Shindo, Toshiki, 4,559,798, Cl. 72-81.000.
IMA Industria Macchine Automatiche SpA: *See*—
Romagnoli, Andrea, 4,559,755, Cl. 53-64.000.
Imanaka, Shoichi. Restaurant food display and serving system. 4,560,032, Cl. 186-38.000.
Imatani, Tsuneo: *See*—
Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, 4,560,430, Cl. 156-285.000.
Imbert, Michel: *See*—
Douziech, Patrick; and Imbert, Michel, 4,561,014, Cl. 358-25.000.
Immunex Corporation: *See*—
Baker, Paul E., 4,560,655, Cl. 435-241.000.
Imperial Chemical Industries, PLC: *See*—
Cramp, John H. W.; Murray, Robert T.; Reid, Robert F.; and Mortier, Roy M., 4,560,248, Cl. 350-96.340.
MacLaine, Colin G.; and Owen, David J., 4,561,037, Cl. 361-228.000.
Imperial Clevite Inc.: *See*—
Shtarkman, Emile M., 4,560,150, Cl. 267-35.000.
Inagaki, Junichi: *See*—
Andow, Fumio; and Inagaki, Junichi, 4,561,120, Cl. 455-612.000.
Inculet, Ion, to Ciba-Geigy AG. Aerial spraying apparatus. 4,560,107, Cl. 239-3.000.
Indata Corporation: *See*—
Jarva, Curt, 4,560,975, Cl. 340-347.0CC.
Inglis, Douglas R. Battery jump cable system. 4,560,230, Cl. 339-224.000.
Inmos Corporation: *See*—
Bourassa, Ronald R.; and Butler, Douglas B., 4,560,419, Cl. 148-1.500.
Inoue, Ikuo: *See*—
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.
Inoue, Noriyuki: *See*—
Maeda, Minoru; Inoue, Noriyuki; and Totsuka, Mikio, 4,560,637, Cl. 430-202.000.
Inoue, Shuichi: *See*—
Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, 4,560,737, Cl. 527-72.000.
Inselmann, Jurgen, to Herbert Kannegiesser GmbH & Co. Device for gluing sheet-like textile articles. 4,560,431, Cl. 156-359.000.
Instance, David J. Apparatus for producing labels. 4,560,432, Cl. 156-459.000.
Institut Francais du Petrole: *See*—
Denis, Jacques; Senneron, Michel; and Sillion, Bernard, 4,560,490, Cl. 252-51.50A.
Institute of Gas Technology: *See*—
Schora, Frank C.; Janka, John C.; and Feldkirchner, Harlan L., 4,560,547, Cl. 423-650.000.
Insulation Technology Corporation: *See*—
Deitesfeld, Rex R., 4,560,307, Cl. 406-63.000.
Intermedicat GmbH: *See*—
Rosskopf, Gerhard, 4,560,979, Cl. 340-540.000.
International Business Machines Corporation: *See*—
Brown, Karen H.; Moore, David F.; and van der Hoeven, Bernard J. C., Jr., 4,560,435, Cl. 156-643.000.
Duncan, William S., 4,560,956, Cl. 331-116.00R.
Eastman, Dean E.; Eldridge, Jerome M.; Petersen, Kurt E.; and Olive, Graham, 4,561,040, Cl. 361-385.000.
Jackowski, Stefan P.; and Moyer, James T., 4,561,094, Cl. 371-24.000.
Korch, Hans-Erdmann, 4,561,015, Cl. 358-44.000.
Melnyk, George, 4,560,929, Cl. 324-207.000.
Moksvold, Tor W., 4,560,583, Cl. 427-88.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,560,776, Cl. 549-356.000.
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,791, Cl. 560-254.000.
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,802, Cl. 568-388.000.
Hall, John B.; Sanders, James M.; and Siano, James N., 4,560,499, Cl. 252-522.00R.
Wiegers, Wilhelmus J., 4,560,500, Cl. 252-522.00R.
International Standard Electric Corporation: *See*—
Epworth, Richard E., 4,561,119, Cl. 455-609.000.
Hansen, Bjorn N., 4,560,840, Cl. 179-81.00B.
International Telephone and Telegraph Corporation: *See*—
Hess, Dale N., 4,560,125, Cl. 248-55.000.
West, Michael D., 4,560,140, Cl. 251-11.000.
Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; and Ohmori, Takashi, 4,560,988, Cl. 346-1.100.
Ippolito, Vincent A. Paint caddy. 4,560,127, Cl. 248-210.000.
Isaacs, Michael S.; and Blacksberg, Richard. Inflatable assembly with edge closure. 4,560,360, Cl. 446-222.000.
Ishibashi, Kazuhisa: *See*—
Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, 4,560,430, Cl. 156-285.000.
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, to Fanuc Ltd. Speed detecting apparatus. 4,560,927, Cl. 324-166.000.
Ishida, Masaaki: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, 4,560,654, Cl. 435-115.000.
Ishida, Takeshi; and Ishida, Yoshihiro. Injection molding instrument for forming resin concave lenses. 4,560,342, Cl. 425-562.000.
Ishida, Yoshihiro: *See*—
Ishida, Takeshi; and Ishida, Yoshihiro, 4,560,342, Cl. 425-562.000.
Ishihara, Joo: *See*—
Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, 4,560,404, Cl. 75-0.50C.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Nakata, Kazuo; Ishikawa, Tsuneo; Amamoto, Taro; and Kawamura, Toshihiko, 4,560,544, Cl. 423-266.000.
Ishii, Shinzo: *See*—
Katsumata, Hideo; Katsumata, Shigeo; Ishii, Shinzo; and Arai, Yuko, 4,560,661, Cl. 435-183.000.
Ishijima, Koji: *See*—
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, 4,560,329, Cl. 418-47.000.
Ishikawa, Hitoshi; and Kano, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Constant-voltage circuit insensitive to source change. 4,560,919, Cl. 323-314.000.
Ishikawa, Keiichi: *See*—
Kozono, Shigeru; and Ishikawa, Keiichi, 4,561,114, Cl. 455-226.000.
Ishikawa, Tsuneo: *See*—
Nakata, Kazuo; Ishikawa, Tsuneo; Amamoto, Taro; and Kawamura, Toshihiko, 4,560,544, Cl. 423-266.000.
Ishitani, Tohru: *See*—
Tamura, Hifumi; Okano, Hiroshi; Ishitani, Tohru; and Shimase, Akira, 4,560,907, Cl. 315-111.010.
Ishitobi, Tamio: *See*—
Fujiwara, Takashi; and Ishitobi, Tamio, 4,560,743, Cl. 528-348.000.
Ishler, Michael W., to Owens-Corning Fiberglass Corporation. Air-supported fabric roof structure. 4,559,746, Cl. 52-2.000.
Isomae, Kazuo: *See*—
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, 4,560,785, Cl. 560-52.000.
Isono, Keinosuke, to Terumo Corporation. Medical container. 4,560,382, Cl. 604-408.000.
Ito, Koichi: *See*—
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, 4,560,679, Cl. 514-63.000.
Itoh, Hisao: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.
Itoh, Kunio: *See*—
Nakamura, Tsutomu; and Itoh, Kunio, 4,560,719, Cl. 524-269.000.
Itow, Hisawo: *See*—
Yoshida, Toshimi; Nakata, Kiyotomo; Masaoka, Isao; and Itow, Hisawo, 4,560,407, Cl. 75-128.00N.
ITT Industries, Inc.: *See*—
Pfeifer, Heinrich, 4,561,115, Cl. 455-228.000.
Sauer, Wolfgang, 4,560,955, Cl. 331-116.00R.
Ivers, John T., to Frito-Lay, Inc. Formulation of dough-based fried snack foods. 4,560,569, Cl. 426-549.000.

Iwai, Hiroshi: *See—*
Maeda, Satoshi; and Iwai, Hiroshi, 4,560,421, Cl. 148-1.500.

Iwai, Yasuyuki: *See—*
Fukuchi, Masakazu; Oishi, Keiji; and Iwai, Yasuyuki, 4,559,898, Cl. 118-653.000.

Iwamoto, Akito; and Sekizawa, Hidekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for optically measuring the distance between two grating-like structures and the size of periodic pattern elements forming one of the grating-like structures. 4,560,280, Cl. 356-375.000.

Iwane, Yasuhiko: *See—*
Sugawara, Fukuo; and Iwane, Yasuhiko, 4,560,294, Cl. 400-145.000.

Iwasaki, Yoshiki: *See—*
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.

Iwase, Sumio, to Mitsubushi Petrochemical Co., Ltd. Heat-resistant phenolic resin foam. 4,560,707, Cl. 521-124.000.

Iwata Air Compressor Mfg. Co., Ltd.: *See—*
Teruyuki, Ohba; Kazuo, Arai; Atushi, Yahagi; and Shigeru, Iwakoshi, 4,560,109, Cl. 239-583.000.

Iwata, Hitoshi: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,559,963, Cl. 137-1.000.

Iwata, Yoshitaka; and Matsuda, Ken, to Mitsubishi Chemical Industries, Ltd. Specular product of bronze-like tone. 4,560,623, Cl. 428-626.000.

Izumi, Chikahiko: *See—*
Hashimoto, Noriaki; Kubo, Kanji; and Izumi, Chikahiko, 4,561,071, Cl. 365-230.000.

Izumisawa, Yoshiaki: *See—*
Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,560,793, Cl. 562-414.000.

J. H. Sessions & Son: *See—*
Werner, Ernest A., 4,560,190, Cl. 292-111.000.

J. I. Case Company: *See—*
Mickelson, Roger D., 4,559,965, Cl. 137-115.000.

J. M. Huber Corporation: *See—*
Hoff, H. Milton, 4,560,176, Cl. 277-105.000.

J. M. Voith GmbH: *See—*
Fauser, Hans, 4,560,860, Cl. 219-470.000.
Kraft, Wilfred; and Benz, Wilhelm, 4,560,441, Cl. 162-273.000.

Jackowski, Stefan P.; and Moyer, James T., to International Business Machines Corporation. Interface checking apparatus. 4,561,094, Cl. 371-24.000.

Jackson, Ronald M.; Olin, Daniel C.; and Anderson, Russell Y., to Tektronix, Inc. Logic waveform display apparatus. 4,560,981, Cl. 340-747.000.

Jacobson, Stephen E., to Halcon SD Group, Inc., The. Process and catalyst useful in the production of glycol aldehyde. 4,560,806, Cl. 568-462.000.

Jaeger, John C. Surgical instrument for gynecological procedures. 4,559,944, Cl. 128-344.000.

Jain, Gyan P., to Phillips Petroleum Company. Fractional distillation process control. 4,560,442, Cl. 203-2.000.

James Howden & Company Limited: *See—*
Sanderson, George F., 4,560,331, Cl. 418-65.000.

James, Stephen R.: *See—*
Langford, Edward A.; Neale, Reginald L.; and James, Stephen R., 4,559,803, Cl. 72-354.000.

Janka, John C.: *See—*
Schora, Frank C.; Janka, John C.; and Feldkirchner, Harlan L., 4,560,547, Cl. 423-650.000.

Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu, 4,560,296, Cl. 400-649.000.
Sano, Yasuro, 4,559,887, Cl. 112-455.000.

Janssen, Peter J. M.; and van Rosmalen, Gerard E., to U.S. Philips Corporation. Opto-electronic apparatus for inscribing and/or reading recording tracks by means of a radiation beam. 4,561,081, Cl. 369-45.000.

Janssen, Petrus H. J.: *See—*
van der Stoel, Roland E.; Bosma, Marcel A. R.; Janssen, Petrus H. J.; and van de Moesdijk, Cornelis G. M., 4,560,760, Cl. 546-243.000.

Janta, Dieter; and Nolde, Wolfgang, to U.S. Philips Corporation. Demodulation circuit having triangular wave for blocking harmonics. 4,560,942, Cl. 329-101.000.

Jarva, Curt, to Indata Corporation. Method of and apparatus for error compensation in electronic analog sensing systems and the like. 4,560,975, Cl. 340-347.0CC.

Jauch, Gerhard: *See—*
Strohl, Willi; and Jauch, Gerhard, 4,559,968, Cl. 137-510.000.

Jean Walterscheid GmbH: *See—*
Vollmer, Jurgen; and Herchenbach, Paul, 4,560,300, Cl. 403-11.000.

Jenkins, Scott A.; and Sparks, Joseph B., to University of California, The Regents of the. Method and apparatus for impeding sediment deposition in harbors and navigation channels. 4,560,304, Cl. 405-74.000.

Jenny, Ernst; and Zumstein, Bruno, to BBC Brown, Boveri & Company, Limited. Method and apparatus for regulating a bypass flow of a supercharged internal combustion engine. 4,559,784, Cl. 60-606.000.

Jerome F. Sheldon Inc.: *See—*
Sheldon, Jerome F., 4,560,065, Cl. 206-427.000.

Jet Research Center, Inc.: *See—*
Regalbuto, John A.; and Christopher, Glenn B., 4,559,890, Cl. 114-230.000.

Jiandani, Niranjan T., to Spirax Sarco, Inc. Bellows-actuated thermostatic steam traps. 4,560,105, Cl. 236-58.000.

Jindo, Katsuo: *See—*
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.

Jira, Reinhard: *See—*
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,560,724, Cl. 524-734.000.

Johannesson, Carl C. E.: *See—*
Tell, Lars E. K. A.; and Johannesson, Carl C. E., 4,560,438, Cl. 162-194.000.

Johansson, Lars E., to Diab-Barracuda AB. Thermal/optical camouflage with controlled heat emission. 4,560,595, Cl. 428-17.000.

Johnson, Bruce K., to Polaroid Corporation. Film unit storage and dispensing apparatus. 4,560,262, Cl. 354-180.000.

Johnson, James A.: *See—*
Peterson, Richard L.; Johnson, James A.; Scheurer, Roger J.; and Steinberg, Richard W., 4,560,011, Cl. 172-194.000.

Johnson, Kenneth C.: *See—*
Knapke, David M.; and Johnson, Kenneth C., 4,559,900, Cl. 118-672.000.

Johnson, Marvin M.: *See—*
Bobsein, Rex L.; and Johnson, Marvin M., 4,560,817, Cl. 585-273.000.
Kukes, Simon G.; and Johnson, Marvin M., 4,560,466, Cl. 208-89.000.

Johnson, Ronald D.; Kastner, Ralph E.; and Boeck, LaVerne D., to Eli Lilly and Company. Antibiotic A39079 factor S-1. 4,560,509, Cl. 260-239.30P.

Johnson, Roy A.: *See—*
Sharpless, Karl B.; and Johnson, Roy A., 4,560,811, Cl. 568-848.000.

Johnson, Russell L.: *See—*
Harke, Elwood W.; Sokolowski, Robert C.; and Johnson, Russell L., 4,560,527, Cl. 264-500.000.

Johnson, Thomas A.: *See—*
Ford, Michael E.; and Johnson, Thomas A., 4,560,798, Cl. 564-503.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,560,821, Cl. 585-500.000.

Jones, Charles D.: *See—*
Hirsch, Kenneth S.; Jones, Charles D.; Taylor, Harold M.; and Winter, Mark A., 4,560,695, Cl. 514-372.000.

Jones, David F.: *See—*
Carson, Robert A.; Fenton, Francis M.; and Jones, David F., 4,560,837, Cl. 179-18.0BD.

Jonsson, Bert O., to Jonsson, Bert O. Object sensing apparatus for an automative door. 4,560,912, Cl. 318-480.000.

Jorn, Frank: *See—*
Affeld, Klaus; Mohnhaupt, Axel; and Jorn, Frank, 4,559,648, Cl. 623-3.000.

Joy, Richard W., to United States of America, Energy. Rapidly refuelable fuel cell. 4,560,626, Cl. 429-27.000.

Judkins, Milton W.; and Williams, Arthur C., to Electrical Hardware, Inc. Conduit support bracket and method for supporting an elongated member. 4,560,126, Cl. 248-72.000.

Jun, Kato: *See—*
Hiroki, Ohta; Masatsugu, Oda; and Jun, Kato, 4,560,682, Cl. 514-100.000.

Jung, Eggert; Roes, Christian; Wigger, Andreas; and Ziemen, Ernst-August, to Dr. -Ing. Rudolf Hell GmbH. Method and apparatus for recording color pictures for multicolor printing. 4,561,016, Cl. 358-76.000.

Jung, Michel: *See—*
Bey, Philippe; and Jung, Michel, 4,560,795, Cl. 562-561.000.

Jurgens, Heinz, to Brown, Boveri & Cie Aktiengesellschaft. Cutting apparatus for stock in the form of bars. 4,559,854, Cl. 83-170.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, 4,560,054, Cl. 192-106.200.
Nagata, Hiroshi, 4,560,044, Cl. 192-3.570.

Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Minamida, Kazukiyo, 4,560,015, Cl. 177-25.000.
Takahashi, Naoki, 4,560,292, Cl. 400-59.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,560,625, Cl. 428-654.000.

Kabushiki Kaisha Sato: *See—*
Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, 4,560,087, Cl. 221-73.000.

Kabushiki Kaisha Suiden: *See—*
Kawai, Yuzo, 4,560,321, Cl. 416-23.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Ichikawa, Matsuo, 4,560,582, Cl. 427-88.000.
Sonehara, Tomio; Murata, Masami; and Ota, Tadashi, 4,560,982, Cl. 340-784.000.

Kabushiki Kaisha Toshiba: *See—*
Kamei, Kiyoho, 4,559,693, Cl. 29-571.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Araki, Hidejiro; and Kodama, Ikuo, 4,559,976, Cl. 139-435.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Sato, Shigeyuki; and Matsushita, Mitsumasa, 4,560,716, Cl. 523-451.000.

Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, to Green Cross Corporation, The. Fibronectin-physiologically active substance complex and method of preparation thereof. 4,560,556, Cl. 424-101.000.

Kai, Fumio: *See—*
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, 4,560,750, Cl. 544-21.000.

Kai, Toshio: *See—*
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.

Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, to Kabushiki Kaisha Kobe Seiko Sho. Aluminum alloy composite materials for brazed heat exchangers. 4,560,625, Cl. 428-654.000.

Kain, William S.: *See—*
Staker, Donald D.; and Kain, William S., 4,560,497, Cl. 252-392.000.

Kaiser, Horst: *See—*
Grossmann, Horst; Herting, Rainer; and Kaiser, Horst, 4,559,857, Cl. 83-471.300.

Kakinoki, Yoshikazu: *See—*
Ando, Moritoshi; Mita, Kikuo; and Kakinoki, Yoshikazu, 4,560,273, Cl. 356-237.000.

Kakumu, Muneharu: *See—*
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,844, Cl. 200-5.00A.
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,845, Cl. 200-5.00A.

Kaladas, Jeffrey J.: *See—*
Schulz, Donald N.; Peiffer, Dennis G.; Kowalik, Ralph M.; and Kaladas, Jeffrey J., 4,560,710, Cl. 523-175.000.

Kallweit, Manfred: *See—*
Blasing, Horst; and Kallweit, Manfred, 4,560,460, Cl. 204-224.00R.

Kamada, Masahiro: *See—*
Kurahashi, Osamu; Kamada, Masahiro; and Enei, Hitoshi, 4,560,652, Cl. 435-108.000.

Kamei, Kiyoho, to Kabushiki Kaisha Toshiba. Process for fabricating field effect transistors. 4,559,693, Cl. 29-571.000.

Kamiya, Akihiko: *See—*
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Kamiya, Kiyoshi: *See—*
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, 4,561,044, Cl. 362-84.000.

Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted-3-cephem-4-carboxylic acid compounds and processes for preparation thereof. 4,560,765, Cl. 548-194.000.

Kamiyama, Hisashi: *See—*
Minami, Yuji; Kamiyama, Hisashi; and Tomita, Toshihide, 4,560,501, Cl. 252-628.000.

Kamp, Ewald A., to Union Carbide Corporation. Interlocking closure bag for use in high temperature environment. 4,561,108, Cl. 383-63.000.

Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Thin developer layer forming device. 4,559,899, Cl. 118-657.000.

Kanamori, Hiroshi, to Nissan Motor Co., Ltd. Collapsible ornament structure. 4,560,597, Cl. 428-31.000.

Kaneda, Shunji: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, 4,560,715, Cl. 523-443.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakagawa, Masao; Mori, Kiyoshi; and Sugita, Toshiaki, 4,560,735, Cl. 526-232.300.

Kano, Kenji: *See—*
Ishikawa, Hitoshi; and Kano, Kenji, 4,560,919, Cl. 323-314.000.

Kano, Masayoshi: *See—*
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,559,888, Cl. 114-74.00R.

Kaplan, Isaac R.: *See—*
Demaison, Gerard J.; and Kaplan, Isaac R., 4,560,664, Cl. 436-29.000.

Kar, Nareshchandra J.; and Roth, Cary A., to Smith International, Inc. Hermetically welded belleville seal for rocks bits. 4,560,175, Cl. 277-92.000.

Kar, Pradip C.: *See—*
Champlin, Keith S.; and Kar, Pradip C., 4,561,088, Cl. 370-16.000.

Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Phosphinylmethylaminocarbonyl imino acid compounds useful for treating hypertension. 4,560,681, Cl. 514-82.000.

Karbstein, Peter, to ACO Severin Ahlmann GmbH & Co. KG. Draining ditch for draining of roadways. 4,560,302, Cl. 404-4.000.

Kardon, Donald R. Adhesively bonded electroluminescent system. 4,560,902, Cl. 313-502.000.

Karita, Toshiaki: *See—*
Hayashi, Motohiko; Karita, Toshiaki; Kotani, Matahira; and Sasaki, Hiromu, 4,560,992, Cl. 346-76.0PH.

Karl Kassbohrer Fahrzeugwerke BmbH: *See—*
Haug, Walter; and Zambelli, Hans D., 4,560,303, Cl. 404-118.000.

Karl Kassbohrer Fahrzeugwerke GmbH: *See—*
Wieland, Erwin H.; and Haug, Walter, 4,559,725, Cl. 37-197.000.

Karliner, Rudy R.: *See—*
Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., 4,559,661, Cl. 15-93.00R.

Karr, Dieter: *See—*
Bruggen, Gerhard; Karr, Dieter; and Rottler, Wolfgang, 4,561,064, Cl. 364-561.000.

Kasai, Yoichi: *See—*
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.

Kashiwaba, Tadao: *See—*
Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, 4,560,087, Cl. 221-73.000.

Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,560,022, Cl. 180-65.100.

Kassai, Kenzou, to Kassai Kabushikikaisha. Electrically driven children's vehicle. 4,560,022, Cl. 180-65.100.

Kastner, Ralph E.: *See—*
Johnson, Ronald D.; Kastner, Ralph E.; and Boeck, LaVerne D., 4,560,509, Cl. 260-239.30P.

Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, to Honda Giken Kogyo Kabushiki Kaisha. Car body of a motorcar. 4,560,198, Cl. 296-185.000.

Katano, Kiyoaki: *See—*
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, 4,560,750, Cl. 544-21.000.

Kataoka Bussan Kabushiki Kaisha: *See—*
Kataoka, Joji, 4,560,475, Cl. 210-249.000.

Kataoka, Joji, to Kataoka Bussan Kabushiki Kaisha. Filter assembly with supporting edges. 4,560,475, Cl. 210-249.000.

Katashima, Seiji: *See—*
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,559,989, Cl. 164-228.000.

Kato, Kenji, to Nippon Oil and Fats Co., Ltd. Diacyl peroxide composition. 4,560,495, Cl. 252-186.230.

Kato, Mitsuru: *See—*
Toyama, Hiroshige; Mizuno, Yoshiyuki; Yamamoto, Yoshimi; and Kato, Mitsuru, 4,560,115, Cl. 242-107.40A.

Kato, Toshiyuki: *See—*
Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, 4,560,332, Cl. 418-83.000.

Kato, Yasuji; Kobayashi, Hiroyuki; and Yamamoto, Yukio, to Yamasa Tokei Meter Co., Ltd. Condition regulating device for the meters for measuring the quantity of motion. 4,560,861, Cl. 235-105.000.

Katschinski, Ulrich: *See—*
Greilinger, Friedrich; and Katschinski, Ulrich, 4,559,990, Cl. 164-428.000.

Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Drive system for a vibration wave motor for lens control. 4,560,263, Cl. 354-195.100.

Katsumata, Hideo; Katsumata, Shigeo; Ishii, Shinzo; and Arai, Yuko, to Kyowa Hakko Kogyo Co., Ltd. Process for purifying enzymes. 4,560,661, Cl. 435-183.000.

Katsumata, Shigeo: *See—*
Katsumata, Hideo; Katsumata, Shigeo; Ishii, Shinzo; and Arai, Yuko, 4,560,661, Cl. 435-183.000.

Katz, Amnon. Liquid crystal active light shield. 4,560,239, Cl. 350-331.00R.

Kaufmann, Dieter: *See—*
Enderle, Eckhard; and Kaufmann, Dieter, 4,560,213, Cl. 308-5.00R.

Kavaloski, Peter P.: *See—*
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., 4,559,939, Cl. 128-201.280.

Kawabata, Takashi: *See—*
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, 4,560,864, Cl. 250-201.000.

Kawada, Emiko: *See—*
Kubo, Sanae; and Kawada, Emiko, 4,560,554, Cl. 424-71.000.

Kawaguchi, Susumu: *See—*
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, 4,560,329, Cl. 418-47.000.

Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, to Naniwa Products Co. Entirely automatic, cold box type machine for molding an integral connecting core. 4,559,989, Cl. 164-228.000.

Kawai, Shinji: *See—*
Yamaguchi, Yuji; and Kawai, Shinji, 4,559,964, Cl. 137-107.000.

Kawai, Sumikazu: *See—*
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,559,989, Cl. 164-228.000.

Kawai, Wasaburo: *See—*
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, 4,560,640, Cl. 430-280.000.

Kawai, Yuzo, to Kabushiki Kaisha Suiden. Ceiling fan. 4,560,321, Cl. 416-23.000.

Kawakami, Kiyoshi: *See—*
Naka, Yasushi; and Kawakami, Kiyoshi, 4,560,611, Cl. 428-266.000.

Kawamoto, Hirohisa: *See—*
Fox, Leonard P.; Datta, Pabitra; Matthies, Dennis L.; and Kawamoto, Hirohisa, 4,561,087, Cl. 369-276.000.

Kawamura, Hideaki: *See—*
Sato, Yuichi; Sakurada, Nobuaki; Kawamura, Hideaki; and Watanabe, Yoshitaka, 4,560,997, Cl. 346-140.00R.

Kawamura, Toshihiko: *See*—
Nakata, Kazuo; Ishikawa, Tsuneo; Amamoto, Taro; and Kawamura, Toshihiko, 4,560,544, Cl. 423-266.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Saito, Yu; and Harada, Tsuneo, 4,560,615, Cl. 428-328.000.
Kawashima, Chikashi: *See*—
Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, 4,560,737, Cl. 527-72.000.
Kawata, Shoji: *See*—
Sakakibara, Naoji; Amano, Hiroyuki; Morioka, Hiroaki; and Kawata, Shoji, 4,559,864, Cl. 91-454.000.
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Daikin Seisakusho. Clutch disc structure. 4,560,054, Cl. 192-106.200.
Kayser, Albrecht, to .Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Linder Hohe. Rotary piston machine having a plurality of chambers containing reciprocating flap pistons. 4,560,328, Cl. 418-8.000.
Kazuo, Arai: *See*—
Teruyuki, Ohba; Kazuo, Arai; Atushi, Yahagi; and Shigeru, Iwakoshi, 4,560,109, Cl. 239-583.000.
Keller, Herbert W.: *See*—
Radford, Kenneth C.; Keller, Herbert W.; Parks, Beryl H.; and Fuller, Robert R., 4,560,462, Cl. 204-298.000.
Kellett, Robert N. Crate carrying apparatus. 4,560,317, Cl. 414-672.000.
Kendall Company, The: *See*—
Vinson, Kenneth D., 4,559,937, Cl. 128-132.00D.
Kent, Albert C.: *See*—
Rosen, Howard N.; Kent, Albert C.; and Girod, George F., 4,559,823, Cl. 73-338.000.
Kent-Tieghi S.p.A.: *See*—
Bianchi, Gianfranco; Borelli, Riccardo; and Pierpaoli, Piero, 4,559,829, Cl. 73-708.000.
Keppel, Robert A.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,560,674, Cl. 502-209.000.
Kerekes, Bela, to Egyesult Izzolampa es Villamossagi RT. Lighting system and compact electric lighting unit. 4,560,906, Cl. 315-47.000.
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Khan, Aurangzeb K., to Fairchild Camera & Instrument Corporation. High-speed error correcting random access memory system. 4,561,095, Cl. 371-38.000.
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Harke, Elwood W.; Sokolowski, Robert C.; and Johnson, Russell L., 4,560,527, Cl. 264-500.000.
Kindler, Ulrich, to U.S. Philips Corporation. Arrangement for the suppression of signal interference. 4,561,068, Cl. 364-825.000.
King, Clarence J., to Straits Steel & Wire Co. Rack with detachable dividers. 4,560,073, Cl. 211-184.000.
Kinnerly, Anthony G.: *See*—
Parkinson, Colin C. A.; and Kinnerly, Anthony G., 4,560,122, Cl. 244-54.000.
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, to Canon Kabushiki Kaisha. Focus detecting device. 4,560,864, Cl. 250-201.000.
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Kirby, Ian G., to Ford Motor Co. Power assisted steering gear. 4,560,023, Cl. 180-148.000.
Kirchmayr, Rudolf: *See*—
Berner, Godwin; and Kirchmayr, Rudolf, 4,560,709, Cl. 204-159.140.
Kirkpatrick, John A.: *See*—
Budrean, John D.; and Kirkpatrick, John A., 4,559,802, Cl. 72-349.000.
Kishimoto, Shoji: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,560,508, Cl. 260-239.00A.
Kistler Instrumente A.G.: *See*—
Engeler, Paul; and Wolfer, Peter, 4,559,821, Cl. 73-167.000.
Kitagawa, Yosuke: *See*—
Shimizu, Goro; and Kitagawa, Yosuke, 4,560,604, Cl. 428-87.000.
Kitamura, Shuji: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.
Kitani, Motoe: *See*—
Segawa, Hirohisa; Kitani, Motoe; Shimizu, Takao; and Mizuno, Masanori, 4,560,857, Cl. 219-130.210.
Kitazawa, Toshiyuki; Morisawa, Tahei; and Takahashi, Norimichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for displaying data in camera viewfinder. 4,560,264, Cl. 354-219.000.
Kitchen, Terence J., to SPRI Limited. Rheometer and method of use thereof. 4,559,812, Cl. 73-59.000.
Kitoo, Makoto: *See*—
Kokaku, Yuuichi; Kitoo, Makoto; and Honda, Yoshinori, 4,560,641, Cl. 430-312.000.
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Klein, John M. Adjustable gun rack for automotive passenger compartments. 4,560,134, Cl. 248-511.000.
Klein, Klaus W.: *See*—
Bocker, Jurgen; Klein, Klaus W.; and Gersbach, Klaus, 4,559,876, Cl. 102-520.000.
Kleppe, Peder J.; and Storebraten, Sverre, to M. Peterson & Son A/S. Process for delignification of chemical wood pulp using sodium sulphite or bisulphite prior to oxygen-alkali treatment. 4,560,437, Cl. 162-65.000.
Klingshield South Africa (Proprietary) Limited: *See*—
Levy, Leon A.; and Matthews, Anthony, 4,559,732, Cl. 40-595.000.
Klink, Josef: *See*—
Koelle, Erwin; and Klink, Josef, 4,560,202, Cl. 297-410.000.
Kljuchnikov, Valery F.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Klopp, Jerome C.; and Willigman, John, to Singer Company, The. Increased capacity program timer. 4,560,846, Cl. 200-38.00R.
KMW Aktiebolag: *See*—
Svensson, Sven A.; Oledal, Bo J. M.; and Lofgren, Stig-Gunnar E., 4,559,986, Cl. 144-208.00B.
Tell, Lars E. K. A.; and Johannesson, Carl C. E., 4,560,438, Cl. 162-194.000.
Knapke, David M.; and Johnson, Kenneth C., to F. J. Littell Machine Co. Device for coating strip material. 4,559,900, Cl. 118-672.000.
Knapp, Alan G.; and Mansell, John R., to U.S. Philips Corporation. Color picture display tube. 4,560,898, Cl. 313-400.000.
Knauer, Wolfgang; and Perkins, Walter E., Jr., to Hughes Aircraft Company. Electron and ion beam-shaping apparatus. 4,560,878, Cl. 250-396.00R.
Kniffin, John M.: *See*—
Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., 4,560,989, Cl. 346-1.100.
Knoll, Gunther: *See*—
Frey, Thomas; Grunwald, Werner; Knoll, Gunther; and Weyl, Helmut, 4,560,463, Cl. 204-424.000.
Knorreck, Peter: *See*—
Ebert, Rolf; Knorreck, Peter; Kramer, Manfred; and Merkel, Wilfried, 4,559,816, Cl. 73-119.00A.
Kobayashi, Hiroyuki: *See*—
Kato, Yasuji; Kobayashi, Hiroyuki; and Yamamoto, Yukio, 4,560,861, Cl. 235-105.000.
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Tezuka, Yoshitomo; Nakagawa, Takeo; and Kobayashi, Kazusuke, 4,560,622, Cl. 428-599.000.
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Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,560,589, Cl. 427-249.000.
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Phillips, James W.; and Kobos, Duane M., 4,559,834, Cl. 73-861.550.

Koch, Ferdinand: *See*—
Scharf, Rolf; Koch, Ferdinand; and Schlussler, Hans-Joachim, 4,560,493, Cl. 252-174.160.

Kochi, Susumu: *See*—
Arai, Sakuji; Sato, Katsuaki; Kochi, Susumu; and Hishida, Hiroaki, 4,559,776, Cl. 60-280.000.

Kocks Technuk GmbH & Co.: *See*—
Funke, Gunther; and Eick, Hans-Joachim, 4,559,799, Cl. 72-224.000.

Koda, Seido, to Osaka Kiko Kabushiki Kaisha. Method of checking pallets or articles to be worked by automatically measuring average diameter of hole and apparatus for practicing same. 4,559,710, Cl. 33-178.00E.

Kodama, Eiji: *See*—
Sakamoto, Takashi; Sano, Tetsuo; Kodama, Eiji; and Choh, Masamichi, 4,561,061, Cl. 364-550.000.

Kodama, Ikuo: *See*—
Araki, Hidejiro; and Kodama, Ikuo, 4,559,976, Cl. 139-435.000.

Koelle, Erwin; and Klink, Josef, to Daimler-Benz Aktiengesellschaft. Headrest of a motor vehicle seat. 4,560,202, Cl. 297-410.000.

Koelmel, Donald; and Shalaby, Shalaby W., to Ethicon, Inc. Absorbable crystalline alkylene malonate copolyesters and surgical devices therefrom. 4,559,945, Cl. 128-335.500.

Koenig & Bauer Aktiengesellschaft: *See*—
Kutzner, Willi A. P.; Schneider, Georg; and Kubert, Thomas, 4,559,871, Cl. 101-207.000.

Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, to Dowa Mining Co., Ltd.; and Dowa Metal Developping Center Co., Ltd. Liquid composition for artificial production of verdigris. 4,560,415, Cl. 106-286.300.

Kohara, Masanobu; Nakao, Shin; and Shibata, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Dimensionally stabie semiconductor device. 4,561,011, Cl. 356-81.000.

Kohler, Michael B.: *See*—
Enochs, Frank L.; and Kohler, Michael B., 4,560,058, Cl. 198-426.000.

Kohmoto, Shinsuke: *See*—
Ohkura, Zenichi; and Kohmoto, Shinsuke, 4,560,237, Cl. 350-255.000.

Koide, Mikio: *See*—
Aoyagi, Juuro; Ichikawa, Toshiji; Koide, Mikio; and Shimomura, Takeshi. 4,560,720, Cl. 524-288.000.

Kojo, Hidehiko; Akimoto, Koji; and Urihara, Kazuhiro, to Asahi Denka Kogyo K.K. Coating composition. 4,560,732, Cl. 525-481.000.

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Kolondra, Frank: *See*—
Wu, Chung P.; and Kolondra, Frank, 4,560,879, Cl. 250-492.200.

Komada, Mitsuharu: *See*—
Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, 4,560,713, Cl. 523-400.000.

Komatsu, Yoshimi: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.

Komenou, Kazunari: *See*—
Satoh, Yoshio; Yanase, Takeyasu; and Komenou, Kazunari, 4,561,069, Cl. 365-36.000.

Komura, Makoto: *See*—
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.

Komura, Michihiro: *See*—
Totani, Tetsushi; Aono, Katsutoshi; and Komura, Michihiro, 4,560,781, Cl. 556-137.000.

Kondo, Koichi: *See*—
Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, 4,560,087, Cl. 221-73.000.

Kondo, Naoyoshi: *See*—
Sato, Jinichi; Kurusu, Toshiro; Kondo, Naoyoshi; and Tamaki, Makoto, 4,560,571, Cl. 426-594.000.

Kondo, Tsuneo: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fukuchi, Masakazu; Oishi, Keiji; and Iwai, Yasuyuki, 4,559,898, Cl. 118-653.000.

Korch, Hans-Erdmann, to International Business Machines Corporation. All-solid-state television camera. 4,561,015, Cl. 358-44.000.

Korlatzki, Rudi: *See*—
Erk, Gayyur; and Korlatzki, Rudi, 4,560,520, Cl. 264-22.000.

Koshino, Yutaka: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,560,642, Cl. 430-313.000.

Koss, Richard N.: *See*—
Yellin, Jacob A.; and Koss, Richard N., 4,560,600, Cl. 428-43.000.

Kotani, Kozo: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.

Kotani, Matahira: *See*—
Hayashi, Motohiko; Karita, Toshiaki; Kotani, Matahira; and Sasaki, Hiromu, 4,560,992, Cl. 346-76.0PH.

Kotani, Sumihisa: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.

Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,561,036, Cl. 361-20.000.

Kouno, Tsutomu. Distance-measuring system using orthogonal magnetic field generators and orthogonal magnetic field sensors. 4,560,930, Cl. 324-207.000.

Kouns, Charles W. Optical method for remote determination of the geological nature of a homogeneous surface. 4,560,279, Cl. 356-369.000.

Kovacs, Jenoe: *See*—
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, 4,560,456, Cl. 204-159.140.

Kowalik, Ralph M.: *See*—
Schulz, Donald N.; Peiffer, Dennis G.; Kowalik, Ralph M.; and Kaladas, Jeffrey J., 4,560,710, Cl. 523-175.000.

Kozono, Shigeru; and Ishikawa, Keiichi, to Nippon Telegraph & Telephone Public Corporation. Cochannel interference measurement system. 4,561,114, Cl. 455-226.000.

Kracke, Alan G.; Hennenfent, Douglas J.; and Holmstrand, Allan L., to Magnetic Peripherals, Inc. Method for calibrating a machining sensor. 4,559,743, Cl. 51-165.00R.

Kraft, Wilfred; and Benz, Wilhelm, to J. M. Voith GmbH. Press section for a paper-making machine having a movable cantilever beam. 4,560,441, Cl. 162-273.000.

Kramer, George M.; and Ernst, Edwin R., to Exxon Research & Engineering Company. Adamantane derivative/surfactant catalyzed paraffin-olefin alkylation. 4,560,825, Cl. 585-724.000.

Kramer, Manfred: *See*—
Ebert, Rolf; Knorreck, Peter; Kramer, Manfred; and Merkel, Wilfried, 4,559,816, Cl. 73-119.00A.

Krause, Ruben L.: *See*—
Pischke, James W.; McFadden, Russell T.; Krause, Ruben L.; and Moore, Charles H., 4,560,736, Cl. 526-312.000.

Kregler, Helmuth: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Kretschmer, Jurgen: *See*—
Lang, Werner; and Kretschmer, Jurgen, 4,560,189, Cl. 285-158.000.

Kristoffersen, Kjell: *See*—
Angelsen, Bjorn A. J.; and Kristoffersen, Kjell, 4,559,952, Cl. 128-663.000.

Kroener, Michael: *See*—
Brunnmueller, Fritz; and Kroener, Michael, 4,560,756, Cl. 544-408.000.

Krone GmbH: *See*—
Weber, Jens; and Czempiel, Ernst-Michael, 4,560,833, Cl. 179-2.0TV.

Kruk, Alexandr T.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Krumenacker, Leon: *See*—
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,560,801, Cl. 568-362.000.

Krummacher, Martin W.; Harmon, Lavon A.; and Clipfell, Perry E. System for the treatment of waste products. 4,559,870, Cl. 100-215.000.

Krupp Polysius AG: *See*—
Weber, Paul, 4,560,412, Cl. 106-101.000.

Krusche, Alfred, to Linde Aktiengesellschaft. Control device for a hydrostatic transmission. 4,559,778, Cl. 60-447.000.

Kruse, Jerry L.: *See*—
Ritchey, Stephen; and Kruse, Jerry L., 4,559,782, Cl. 60-605.000.

Kubert, Thomas: *See*—
Kutzner, Willi A. P.; Schneider, Georg; and Kubert, Thomas, 4,559,871, Cl. 101-207.000.

Kubetin, William T. Cutter tip measuring device. 4,559,712, Cl. 33-201.000.

Kubo, Kanji: *See*—
Hashimoto, Noriaki; Kubo, Kanji; and Izumi, Chikahiko, 4,561,071, Cl. 365-230.000.

Kubo, Sanae; and Kawada, Emiko, to Shiseido Company Ltd. Neutralizer for cold waving. 4,560,554, Cl. 424-71.000.

Kubo, Yoichiro: *See*—
Watanabe, Noboru; and Kubo, Yoichiro, 4,560,729, Cl. 525-233.000.

Kubodera, Noboru: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Kubota, Hayato: *See—*
Narimatsu, Hiroki; Sakamoto, Kenshi; Edayoshi, Tomoko; and Kubota, Hayato, 4,560,560, Cl. 426-38.000.

Kubota, Hitoshi, to Nissan Motor Co., Ltd. Brake pressure control unit of deceleration-responsive type. 4,560,208, Cl. 303-6.00C.

Kubota, Ltd.: *See—*
Murakami, Shinichi; and Mihara, Takao, 4,560,931, Cl. 324-220.000.

Kubota, Yuichi: *See—*
Nishimatsu, Masaharu; Kubota, Yuichi; Tamazaki, Kazunori; and Shimada, Shigeru, 4,560,617, Cl. 428-423.100.

Kubotsu, Akira: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, 4,560,715, Cl. 523-443.000.

Kucharska, Helena Z.: *See—*
Burton, Thomas M.; and Kucharska, Helena Z., 4,560,706, Cl. 521-85.000.

Kuhara, Yoshiki: *See—*
Mitsui, Tsutoɪ•ɪ; Tada, Konji; Kuhara, Yoshiki; and Tatsumi, Masami, 4,560,932, Cl. 324-244.000.

Kuhn, Gunther: *See—*
Baldszun, Karl; Grazianski, Thomas; and Kuhn, Gunther, 4,560,269, Cl. 356-246.000.

Kuhn, Loughrey R., to Optical Communications Corporation. Fiber optic digital data transmitting system. 4,561,117, Cl. 455-608.000.

Kuivila, Charles S.: *See—*
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,560,448, Cl. 204-67.000.

Kukes, Simon G.; and Johnson, Marvin M., to Phillips Petroleum Company. Hydrodemetallization of heavy oils in the presence of water. 4,560,466, Cl. 208-89.000.

Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,560,468, Cl. 208-110.000.

Kullmann, Udo: *See—*
Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, 4,560,624, Cl. 428-632.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.

Kumm, John H.: *See—*
Kumm, William H.; and Kumm, John H., 4,559,761, Cl. 53-397.000.

Kumm, William H.; and Kumm, John H. Method for transporting insulation to a work area. 4,559,761, Cl. 53-397.000.

Kung, Wei-jen; and Vogelhut, Paul O., to Miles Laboratories, Inc. Polymer catalyst transducers. 4,560,534, Cl. 422-68.000.

Kuno, Hiroaki: *See—*
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.

Kunold, Robert, Jr. Device for cleaning contact lens. 4,559,662, Cl. 15-104.940.

Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, to Texas Instruments. High density, electrically erasable, floating gate memory cell. 4,561,004, Cl. 357-23.500.

Kupperman, David S.; and Lanham, Ronald N., to United States of America, Energy. Ultrasonic shear wave couplant. 4,559,827, Cl. 73-644.000.

Kurahashi, Osamu; Kamada, Masahiro; and Enei, Hitoshi, to Ajinomoto Co., Inc. Process for producing L-tryptophan by fermentation. 4,560,652, Cl. 435-108.000.

Kuraray Co., Ltd.: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, 4,560,715, Cl. 523-443.000.

Kurashima, Hideo: *See—*
Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, 4,560,430, Cl. 156-285.000.

Kurokawa, Koshiro: *See—*
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,560,295, Cl. 400-637.100.

Kurono, Masayasu: *See—*
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, 4,560,679, Cl. 514-63.000.

Kurusu, Toshiro: *See—*
Sato, Jinichi; Kurusu, Toshiro; Kondo, Naoyoshi; and Tamaki, Makoto, 4,560,571, Cl. 426-594.000.

Kusano, Shoji: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.

Kushigian, Anthony. Grinding wheel profiler. 4,559,919, Cl. 125-11.00R.

Kuster, Karl H., to GTE Automatic Electric Incorporated. Single transistor forward converter with lossless magnetic core reset and snubber network. 4,561,046, Cl. 363-21.000.

Kuster, Kaspar: *See—*
Bossard, Alfred E.; and Kuster, Kaspar, 4,559,896, Cl. 118-300.000.

Kutzner, Willi A. P.; Schneider, Georg; and Kubert, Thomas, to Koenig & Bauer Aktiengesellschaft. Ink divider for ink fountain rollers. 4,559,871, Cl. 101-207.000.

Kuwamura, Tsukasa: *See—*
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, 4,560,785, Cl. 560-52.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Katsumata, Hideo; Katsumata, Shigeo; Ishii, Shinzo; and Arai, Yuko, 4,560,661, Cl. 435-183.000.

Kyushu Institute of Technology: *See—*
Terada, Akira; and Tanoue, Yasuhiro, 4,560,511, Cl. 260-396.00R.

Laboratoires Merck Sharp & Dohme Chibret: *See—*
Paoletti, Jean-Claude, 4,559,983, Cl. 141-260.000.

Lacka, Cemal. Safe. 4,559,880, Cl. 109-51.000.

Lacroix, Roger; and Marfurt, Hans-Rudolf, to Ciba Geigy Corporation. Process for converting sparingly soluble salts of anionic dyes and fluorescent brighteners into more soluble salts by means of cation exchange. 4,560,480, Cl. 210-638.000.

Ladouceur, Lawrence C., to Randall Wheel Trim, Inc. Wheel cover manufacturing apparatus. 4,559,689, Cl. 29-243.520.

Lafonta, Fernande F.; and Lafonta, Paul A., to ETAT Francais. High voltage amplifier for capacitive load. 4,560,914, Cl. 320-1.000.

Lafonta, Paul A.: *See—*
Lafonta, Fernande F.; and Lafonta, Paul A., 4,560,914, Cl. 320-1.000.

LaGross, Dennis L.: *See—*
Berthel, Robert O.; Plank, Vernon G.; and LaGross, Dennis L., 4,561,018, Cl. 358-107.000.

Lahti, Robert A.: *See—*
McCall, John M.; and Lahti, Robert A., 4,560,767, Cl. 548-578.000.

LaHue, Philip M.: *See—*
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,559,713, Cl. 33-302.000.

Lambert, Thomas W.: *See—*
Andrews, Edward W.; and Lambert, Thomas W., 4,561,054, Cl. 364-414.000.

Landingham, Richard L., to United States of America, Energy. Porous metallic bodies. 4,560,621, Cl. 428-566.000.

Lang, Werner; and Kretschmer, Jurgen, to Daimler-Benz Aktiengesellschaft. Sealing connection. 4,560,189, Cl. 285-158.000.

Langford, Edward A.; Neale, Reginald L.; and James, Stephen R., to PFD Limited. Tool for making hollow articles. 4,559,803, Cl 72-354.000.

Langlie, Howard; and Berg, Albert T., Jr. Electric fencer utilizing a sealed plastic housing. 4,560,827, Cl. 174-52.00S.

Lanham, Ronald N.: *See—*
Kupperman, David S.; and Lanham, Ronald N., 4,559,827, Cl. 73-644.000.

Lanier, William D., to City of Albany, Georgia. Sewer cleaner apparatus. 4,559,960, Cl. 134-166.00C.

Lankard, David R.; and Shoop, James D., to Diebold, Incorporated. Burglary resistant steel fiber reinforced concrete construction for vault walls and doors and manufacture thereof. 4,559,881, Cl. 109-83.000.

Larom, Dov; and Shahar, Gabriel, to Ellar B.M. Speed limiting device of engine and/or vehicle. 4,559,912, Cl. 123-350.000.

Laskowski, Donald R.; and Tekulve, Daniel R., to Laskowski Enterprises, Incorporated. Portable band saw saw mill apparatus. 4,559,858, Cl. 83-801.000.

Laskowski Enterprises, Incorporated: *See—*
Laskowski, Donald R.; and Tekulve, Daniel R., 4,559,858, Cl. 83-801.000.

Laskowski, Stanley C.: *See—*
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,560,753, Cl. 544-279.000.

Lassiaz, Philippe, to Valeo. Clutch release bearing mounting assembly. 4,560,053, Cl. 192-98.000.

Latchways Limited: *See—*
Tupp.er, Alan W., 4,560,098, Cl. 226-92.000.

Laughlin, William C.: *See—*
Cleary, Michael T.; and Laughlin, William C., 4,560,675, Cl. 502-407.000.

Leach, Jerald G., to Texas Instruments Incorporated. Low power oscillator circuit. 4,560,954, Cl. 331-108.00B.

Lear Siegler, Inc.: *See—*
Hemond, Robert F., 4,561,060, Cl. 364-478.000.
McGowan, Gerald F.; Price, Gerald W.; Polhemus, Carl E.; and Ketchum, Ronald L., 4,560,873, Cl. 250-339.000.

Lebed, Alexandr D.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Ledan, Inc.: *See—*
Frois, Mauricio; and Leo, Daniel W., 4,559,731, Cl. 40-546.000.

Lee, Frederick C.: *See—*
De Boynton, William L.; Lee, Frederick C.; Wilson, Bruce E.; and O'Rourke, John F., 4,559,711, Cl. 33-199.00R.

Lee, Gerry A.: *See—*
McCumber, Roger D.; Peterson, Thomas L.; and Lee, Gerry A., 4,560,293, Cl. 400-61.000.

Lee L. Woodard, Inc.: *See—*
Colby, Donald B., 4,559,878, Cl. 108-132.000.

Lee, Shy-Fuh, to Zoecon Corporation. Phosphinates or phosphonates useful for control of weeds. 4,560,752, Cl. 544-66.000.
Leem, Tae Yoon. Writing implement. 4,560,297, Cl. 401-31.000.
Leggett & Platt, Incorporated: *See*—
Whitehead, Larry W., 4,559,657, Cl. 5-286.000.
Legille, Edouard; and Lonardi, Emile, to Paul Wurth S.A. Apparatus for driving an oscillating spout. 4,559,839, Cl. 74-88.000.
Leiber, Heinz, to Robert Bosch GmbH. Power steering apparatus with at least one additional hydraulic load connected to it. 4,559,777, Cl. 60-422.000.
Leins, Eberhard, to Sulzer Morat GmbH. Thread carrier. 4,559,792, Cl. 66-125.00R.
Leiske, Larry G. Anterior chamber intraocular lens. 4,560,383, Cl. 3-13.000.
Leland, John E.: *See*—
Needham, Donald G.; and Leland, John E., 4,560,580, Cl. 427-53.100.
Leland Stanford Junior University, Board of Trustees of the: *See*—
Shaw, Herbert J.; Bergh, Ralph A.; and Digonnet, Michel J. F., 4,560,234, Cl. 350-96.150.
Le Marchand, Claude: *See*—
Gerard, Jean-Louis; Le Marchand, Claude; and Raguier, Marcel, 4,560,038, Cl. 188-73.380.
Lemelson, Jerome H. Communication system and method. 4,560,978, Cl. 340-539.000.
Lemke, Cornelis P., to Rockwell-Rimoldi S.p.A. Sewing machine for forming a plurality of seams. 4,559,883, Cl. 112-136.000.
Lenart, Peter: *See*—
Taylor, Donald K.; Rogers, William; McGary, Vernon; and Lenart, Peter, 4,559,970, Cl. 137-557.000.
Lenell, Lars A., to Telefonaktiebolaget LM Ericsson. Electronic external line repeater. 4,560,843, Cl. 179-170.0NC.
Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Vacuum belt conveyor. 4,560,060, Cl. 198-803.500.
Lenk, Erich: *See*—
Runkel, Walter; Lenk, Erich; and Bauer, Karl, 4,560,347, Cl. 432-59.000.
Le Nours, Yannick: *See*—
Helderle, Paul M.; Arnaud, Fabrice R.; and Le Nours, Yannick, 4,560,005, Cl. 166-332.000.
Lenz, Gary A.: *See*—
Burlage, Brian J.; Wiklund, David E.; and Lenz, Gary A., 4,559,832, Cl. 73-861.240.
Lenz, Werner: *See*—
Heil, Guenter; Lenz, Werner; Kovacs, Jenoe; Grau, Werner; and Balz, Werner, 4,560,456, Cl. 204-159.140.
Lenzing, Richard S., to Superior Electric Company, The. Variable transformer with multi-layer coil. 4,560,970, Cl. 336-149.000.
Leo, Daniel W.: *See*—
Frois, Mauricio; and Leo, Daniel W., 4,559,731, Cl. 40-546.000.
Leonard, John J.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,560,821, Cl. 585-500.000.
Leroy, Jean-Luc, to Framatome. Device for partitioning off the core of a nuclear reactor. 4,560,531, Cl. 376-302.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-(Phenyl)-1,6-naphthyridin-2(1H)-ones, their cardiotonic use and preparation. 4,560,691, Cl. 514-300.000.
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., to Sterling Drug Inc. 2-Substituted-pyrido[2,3-d]pyrimidin-5(8H)-ones. 4,560,753, Cl. 544-279.000.
Levendusky, Thomas L.; and Benson, Arthur, to Aluminum Company of America. Container with steam port for use in microwave ovens. 4,560,850, Cl. 219-10.55E.
Lever Brothers Company: *See*—
Ritchey, Thomas W., 4,560,549, Cl. 424-18.000.
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., to Lockheed Corporation. Compatible smoke and oxygen masks for use on aircraft. 4,559,939, Cl. 128-201.280.
Levine, Robert A. Stool sampling device. 4,559,949, Cl. 128-638.000.
Levy, Leon A.; and Matthews, Anthony, to Klingshield South Africa (Proprietary) Limited. Method of applying signs. 4,559,732, Cl. 40-595.000.
Lew, Hyok S.; and Stranahan, Michael. Comparative variable resistance position indicator. 4,560,986, Cl. 340-870.380.
Lewarchik, Ronald J.; and Thompson, Jeffrey W., to DeSoto, Inc. Thermally cured topcoats on vacuum deposited metal. 4,560,728, Cl. 525-123.000.
Lewin, John E.: *See*—
Servas, Frank; Lewin, John E.; Pavlov, Tudor; and Diettrich, Lambert J., Jr., 4,559,999, Cl. 165-156.000.
Lewis, Keith L.; and Savage, James A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method of coating optical components. 4,560,576, Cl. 427-38.000.
Lewis, Michael D.: *See*—
Talley, John J.; Evans, Irene A.; and Lewis, Michael D., 4,560,810, Cl. 568-805.000.
Lewyt, Alexander. Marketing device. 4,559,727, Cl. 40-10.00R.
Lichti, Robert D., to Tarkan, Yusaf. Aircraft loading ramp. 4,559,660, Cl. 14-71.500.
Lieber, Sidney. Stick-on-mask for use with coulometric measuring instruments. 4,560,464, Cl. 204-434.000.
Liebermann, Howard H.: *See*—
Bedell, John R.; Smith, Robert W.; and Liebermann, Howard H., 4,559,992, Cl. 164-463.000.
Liedloff, Manfred: *See*—
Maack, Werner; Gerst, Michael; and Liedloff, Manfred, 4,559,702, Cl. 29-759.000.
Liedtke, Kurt: *See*—
Focke, Heinz H.; and Liedtke, Kurt, 4,559,757, Cl. 53-176.000.
Liggett, John V., to Rockwell International Corporation. Sealing blades for a shrink wrapping process. 4,559,764, Cl. 53-557.000.
Likins, Merle R., Jr.: *See*—
Gaines, Larry D.; and Likins, Merle R., Jr., 4,559,785, Cl. 60-676.000.
Lilliwyte Societe Anonyme: *See*—
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,560,627, Cl. 429-103.000.
Lindbeck, Lester R. Apparatus for pulverizing aggregate masses of frangible materials on and below earth surfaces. 4,560,009, Cl. 172-66.000.
Linde Aktiengesellschaft: *See*—
Krusche, Alfred, 4,559,778, Cl. 60-447.000.
Lindsey, Charles T., to Parker-Hannifin Corporation. Force motor. , 4,560,967, Cl. 335-262.000.
Lipp, Alfred: *See*—
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,560,668, Cl. 501-92.000.
Liss, Bernard: *See*—
Liss, Saul; and Liss, Bernard, 4,559,948, Cl. 128-419.00R.
Liss, Saul; and Liss, Bernard, to Pain Suppression Labs. Cerebral palsy treatment apparatus and methodology. 4,559,948, Cl. 128-419.00R.
Liszka, Ludwik J. System for operational monitoring of a machine. 4,559,828, Cl. 73-658.000.
Littelfuse, Inc.: *See*—
Bukala, Alexander E., 4,560,227, Cl. 339-147.00R.
Oh, Seibang, 4,560,971, Cl. 337-164.000.
Little, Robert A.: *See*—
Shioyama, Tod K.; and Little, Robert A., 4,560,783, Cl. 556-183.000.
Lizzi, Frederic L.; Elbaum, Marek; and Feleppa, Ernest J., to Riverside Research Institute. Frequency diversity for image enhancement. 4,561,019, Cl. 358-112.000.
Lo, Young S., to A. H. Robins Company, Incorporated. Process and intermediates for the preparation of aryl substituted pyrido[1,4]benzodiazepines. 4,560,510, Cl. 260-244.400.
Lobanov, Nikolai A.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Loblaw, James C.; and Lussier, Barbara B., to Eastman Kodak Company. Halftone imaging silver halide emulsions, photographic elements, and processes which employ novel arylhydrazides. 4,560,638, Cl. 430-264.000.
Lockheed Corporation: *See*—
Levine, Harold H.; Kavaloski, Peter P.; and Hale, Thomas K., 4,559,939, Cl. 128-201.280.
Lodec, Inc.: *See*—
Hood, Robert B., 4,560,017, Cl. 177-211.000.
Loewenstein, Paul: *See*—
Heller, Isabelle; and Loewenstein, Paul, 4,560,922, Cl. 324-52.000.
Lofgren, Stig-Gunnar E.: *See*—
Svensson, Sven A.; Oledal, Bo J. M.; and Lofgren, Stig-Gunnar E., 4,559,986, Cl. 144-208.00B.
Loge, Olaf: *See*—
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.
Loizeau, Pierre, to Valeo. Torsional damper. 4,560,366, Cl. 464-68.000.
Lonardi, Emile: *See*—
Legille, Edouard; and Lonardi, Emile, 4,559,839, Cl. 74-88.000.
Long, Delmar D., to Dayco Corporation. Polymeric-coated fabric layer. 4,560,610, Cl. 428-246.000.
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., to Ciba Geigy AG. Protected developing agents. 4,560,646, Cl. 430-566.000.
Looker, Brian E., to Glaxo Group Limited. Cephalosporin antibiotics. 4,560,683, Cl. 514-202.000.
Lord, Herbert A., to AT&T Technologies, Inc. Method for reducing temperature variations across a semiconductor wafer during heating. 4,560,420, Cl. 148-1.500.
Lorello, Mark M.; and Plamper, Gunter F. Door operator. 4,560,046, Cl. 192-11.000.
Lorenz, Joachim: *See*—
Zimmermann, Horst; and Lorenz, Joachim, 4,560,172, Cl. 277-3.000.
Lori, Domenico: *See*—
Credali, Lino; Parrini, Paolo; Milano, Mario; and Lori, Domenico, 4,560,429, Cl. 156-208.000.
LTV Aerospace and Defense Company: *See*—
Giacomel, Jeffrey A., 4,560,603, Cl. 428-86.000.
Lu, Fu-San. Vacuum flask construction. 4,560,075, Cl. 215-13.00R.
Lubrizol Corporation, The: *See*—
Vinci, James N., 4,560,488, Cl. 252-33.000.

Lucas Industries Limited: *See*—
Taft, Philip A., 4,559,780, Cl. 60-548.000.
Woodhouse, John L., 4,560,629, Cl. 429-184.000.

Lucas, Jacques; and Fonteneau, Gilles, to Centre National de la Recherche Scientifique. Halogen glasses modified with carbon disulphide and process of preparation. 4,560,667, Cl. 501-40.000.

Lucas, Peter; and Staveley, John. Detachable bag intended particularly for use with a mobile container. 4,560,096, Cl. 224-42.420.

Ludke, Hartmut: *See*—
Tolle, Hans; Frech, Karl; and Ludke, Hartmut, 4,560,586, Cl. 427-134.000.

Lueders, Arthur L.: *See*—
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.

Luigi Stoppani S.p.A.: *See*—
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,560,546, Cl. 423-607.000.

Lumer, Yakov L.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Lumex, Inc.: *See*—
Giannelli, Raymond; and Martin, Matthew R., 4,560,200, Cl. 297-346.000.

Lunk, Hans E.: *See*—
Reed, Donald A.; and Lunk, Hans E., 4,560,829, Cl. 174-102.00R.

Luong, John C., to Corning Glass Works. Method for making glass or ceramic article. 4,560,399, Cl. 65-18.100.

Lussier, Barbara B.: *See*—
Loblaw, James C.; and Lussier, Barbara B., 4,560,638, Cl. 430-264.000.

Luxtron Corporation: *See*—
Wickersheim, Kenneth A., 4,560,286, Cl. 374-131.000.

Lynch, Michael J.: *See*—
Haley, John E., Jr.; Lynch, Michael J.; and Rosenberg, Jeffrey S., 4,561,057, Cl. 364-436.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Schuhmann, Siegfried; and Schniggenfittig, Gunther, 4,559,874, Cl. 101-350.000.

M. Peterson & Son A/S: *See*—
Kleppe, Peder J.; and Storebraten, Sverre, 4,560,437, Cl. 162-65.000.

Maack, Werner; Gerst, Michael; and Liedloff, Manfred, to AMP Incorporated. Harness making machine having improved wire jig. 4,559,702, Cl. 29-759.000.

MAC Corporation of America: *See*—
Burda, Dan S., 4,560,110, Cl. 241-36.000.

MacLaine, Colin G.; and Owen, David J., to Imperial Chemical Industries PLC. Electrostatic spraying. 4,561,037, Cl. 361-228.000.

Maeda, Kunihiro: *See*—
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, 4,561,010, Cl. 357-74.000.

Maeda, Masaya, to Canon Kabushiki Kaisha. Magnetic recording and/or reproducing apparatus of the cassette type. 4,561,029, Cl. 360-85.000.

Maeda, Minoru; Inoue, Noriyuki; and Totsuka, Mikio, to Fuji Photo Film Co., Ltd. Silver halide sensor type polymerizable light-sensitive material. 4,560,637, Cl. 430-202.000.

Maeda, Satoshi; and Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device and method of manufacturing the same. 4,560,421, Cl. 148-1.500.

Magnetic Peripherals, Inc.: *See*—
Kracke, Alan G.; Hennenfent, Douglas J.; and Holmstrand, Allan L., 4,559,743, Cl. 51-165.00R.
Nordberg, Robert B., 4,560,924, Cl. 324-61.00R.
van der Schans, Albert, 4,560,940, Cl. 328-150.000.

Magyar Szenhidrogenipari Kutato-Fejleszto Intezet: *See*—
Szekely, Eva; and Szekely, Roza, 4,560,485, Cl. 252-7.000.

Maher, Elizabeth A.: *See*—
Burrington, James D.; Grasselli, Robert K.; Pesa, Fred; and Maher, Elizabeth A., 4,560,730, Cl. 525-340.000.

Mallinckrodt, Inc.: *See*—
Meyer, David R., 4,560,574, Cl. 426-649.000.

Mamatsashvili, Vazha I.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Mambelli, Giancarlo, to Motomec S.r.l. Light motorbike with takeoff for powering separate devices. 4,560,020, Cl. 180-53.100.

MAN Maschinenfabrik Unternehmensbereich GHH Sterkrade: *See*—
Blotenberg, Wilfried, 4,560,319, Cl. 415-1.000.

Manatt, Scott A.: *See*—
McDonald, George H.; and Manatt, Scott A., 4,560,394, Cl. 55-16.000.

Manda, Toshitaka: *See*—
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.

Mania, Max J.: *See*—
Schmidts, Kurt; Feyh, Hans-Otto; and Mania, Max J., 4,560,114, Cl. 242-71.800.

Mann, Brian M.: *See*—
Renger, Herman L.; Mann, Brian M.; and Meador, John, 4,559,947, Cl. 128-419.0PG.

Mann, Walter: *See*—
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.

Mannesmann Aktiengesellschaft: *See*—
Deppe, Gerd-Joachim; Ettwig, Hans H.; Schneider, Heinz; and Hof, Wolfram, 4,559,819, Cl. 73-159.000.

Mannhart, Alto; and Rieger, Georg, to Dyckerhoff & Widmann Aktiengesellschaft. Device for securing a sleeve on the abutting ends of reinforcing bars. 4,559,691, Cl. 29-283.500.

Manning, Charles E. Scaffold mounted hoist. 4,560,074, Cl. 212-152.000.

Manning, Phillip R., to Wray, Ashton, Jr., a part interest. Long wearing contact tip for inert gas arc welding. 4,560,858, Cl. 219-137.520.

Mansell, John R.: *See*—
Knapp, Alan G.; and Mansell, John R., 4,560,898, Cl. 313-400.000.

Manser, Gerald E.: *See*—
Guimont, John M.; Manser, Gerald E.; and Ross, Donald L., 4,560,779, Cl. 549-510.000.

Manufacture de Vilebrequins: *See*—
Coquillart, Michel; and Yeretzian, Georges, 4,559,681, Cl. 29-26.00A.

Marathon Oil Company: *See*—
Schroeder, Donald E., Jr.; Plummer, Mark A.; and Zimmerman, Carle C., Jr., 4,560,517, Cl. 260-505.00R.

Marchiano, John. Auxiliary mobility guide for a cane. 4,559,962, Cl. 135-85.000.

Marfurt, Hans-Rudolf: *See*—
Lacroix, Roger; and Marfurt, Hans-Rudolf, 4,560,480, Cl. 210-638.000.

Margaroli, Giovanni; and Gandini, Mario, to Servocavi S.p.A. Electrical connector for flat cables and assembly thereof with a flat cable. 4,560,225, Cl. 339-97.00C.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Process for production of dihydric phenols. 4,560,808, Cl. 568-722.000.

Markem Corporation: *See*—
Perra, Andrew G., Jr., 4,559,872, Cl. 101-228.000.

Marlo Company Incorporated, The: *See*—
Case, Edward M.; and Hopper, Chester S., 4,559,862, Cl. 87-1.000.

Marpoe, Gary R., Jr.: *See*—
Billman, Timothy B.; Coller, James R.; and Marpoe, Gary R., Jr., 4,560,218, Cl. 339-17.0CF.

Marquardt, Richard H., to Fabridyne, Inc. Particle roaster. 4,559,720, Cl. 34-137.000.

Marquest Medical Products, Inc.: *See*—
Bowman, Ronald R.; and Sodal, Ingvar E., 4,560,871, Cl. 250-288.000.

Marquette University: *See*—
Regen, Steven L., 4,560,599, Cl. 428-36.000.

Marshall, William F., to Quantic Industries, Inc. High energy switching circuit for initiator means or the like and method therefor. 4,559,875, Cl. 102-218.000.

Martens, George D., to Automation Industries, Inc. Transducer array for detection of subsurface flaws. 4,559,825, Cl. 73-622.000.

Martin, Lawrence L.; and Setescak, Linda L., to Hoechst-Roussel Pharmaceuticals Inc. Oxothienobenzoxepins, medicinal use, and process for the preparation thereof. 4,560,701, Cl. 514-443.000.

Martin, Manfred: *See*—
Stoldt, August; Stemig, Heinz; Breidohr, Hans-Gunther; and Martin, Manfred, 4,559,884, Cl. 112-262.100.

Martin, Matthew R.: *See*—
Giannelli, Raymond; and Martin, Matthew R., 4,560,200, Cl. 297-346.000.

Martin nee Sturdy, Shirley J.; and McDaniel, Max P., to Phillips Petroleum Company. Polymerization and catalyst. 4,560,733, Cl. 526-129.000.

Martin, Robert A.: *See*—
Anderson, Frank E.; and Martin, Robert A., 4,559,961, Cl. 134-166.00R.

Martin, Ronald J., to Honeywell Inc. Automated inspection of hot steel slabs. 4,561,104, Cl. 382-8.000.

Maruyama, Masanori: *See*—
Takayama, Shigehiko; Maruyama, Masanori; and Fukushima, Masakazu, 4,560,899, Cl. 313-449.000.

Marx, Anton: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Marx, Matthias: *See*—
Horn, Peter; Hesse, Anton; Mann, Walter; Frank, Wolfram; Marx, Matthias; and Heckmann, Walter, 4,560,708, Cl. 521-137.000.

Maryland Cup Corporation: *See*—
Cress, Allan K.; and Busse, Charles E., 4,559,765, Cl. 53-557.000.

Masaki, Yasuo: *See*—
Ueda, Hiroshi; Yoshizaki, Akira; and Masaki, Yasuo, 4,560,261, Cl. 354-121.000.

Masamura, Tatsurou: *See*—
Atsugi, Takeo; Samejima, Shuuichi; and Masamura, Tatsurou, 4,561,099, Cl. 375-97.000.

Masaoka, Isao: *See*—
Yoshida, Toshimi; Nakata, Kiyotomo; Masaoka, Isao; and Itow, Hisawo, 4,560,407, Cl. 75-128.00N.

Masatsugu, Oda: *See*—
Hiroki, Ohta; Masatsugu, Oda; and Jun, Kato, 4,560,682, Cl. 514-100.000.

Maschke, Alfred W., to United States of America, Energy. Electrostatic quadrupole focused particle accelerating assembly with laminar flow beam. 4,560,905, Cl. 315-5.410.

Mason, Edgar G.; Clark, Harold; and Forsythe, James A., to Paton, Hugh. Apparatus and method for holding and cultivating aquatic crustaceans. 4,559,902, Cl. 119-2.000.

Massachusetts Institute of Technology: *See*—
Sharpless, Karl B.; and Johnson, Roy A., 4,560,811, Cl. 568-848.000.

Massey, Roger G.; and Holloway, David G., to Parker & Harper Manufacturing Company, The. Valve handle with selectable stops. 4,559,966, Cl. 137-270.000.

Mast, Aquila D., to Sperry Corporation. Round baler with dual function finger drum. 4,559,770, Cl. 56-341.000.

Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Autozeroed comparator. 4,560,890, Cl. 307-355.000.

Masuda, Isao: *See*—
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.

Masui, Takeshi: *See*—
Yoshida, Masumi; and Masui, Takeshi, 4,561,106, Cl. 382-49.000.

Mathews, Lester R., to Caretaker Systems, Inc. Rotatable hydrotherapy nozzle. 4,559,653, Cl. 4-541.000.

Matsuda, Akio, to NEC Corporation. Still picture transmission apparatus. 4,561,020, Cl. 358-134.000.

Matsuda, Ken: *See*—
Iwata, Yoshitaka; and Matsuda, Ken, 4,560,623, Cl. 428-626.000.

Matsuda, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic processing device using sampled input data and several previous output data. 4,561,065, Cl. 364-724.000.

Matsuda, Yasuhiko: *See*—
Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, 4,560,087, Cl. 221-73.000.

Matsuda, Yasuhiro: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.

Matsuda, Yoshihiko: *See*—
Naganawa, Tadahisa; and Matsuda, Yoshihiko, 4,559,915, Cl. 123-406.000.

Matsuhiro, Keiji; and Matsui, Minoru, to NGK Insulators, Ltd. Silicon nitride sintered bodies of Si_3N_4, Y_2O_3, MgO and ZrO_2. 4,560,669, Cl. 501-97.000.

Matsui, Hiroshi: *See*—
Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, 4,560,654, Cl. 435-115.000.

Matsui, Minoru: *See*—
Matsuhiro, Keiji; and Matsui, Minoru, 4,560,669, Cl. 501-97.000.
Soma, Takao; and Matsui, Minoru, 4,559,824, Cl. 73-432.00R.

Matsui Shikiso Chemical Co., Ltd.: *See*—
Shimizu, Goro; and Kitagawa, Yosuke, 4,560,604, Cl. 428-87.000.

Matsumoto, Kazuya; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Magnetooptic reproducing device. 4,561,032, Cl. 360-114.000.

Matsumoto, Shigeru: *See*—
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Matsumura, Susumu; Suzuki, Takashi; and Suzuki, Kenji, to Canon Kabushiki Kaisha. Focus detecting device. 4,560,863, Cl. 250-201.000.

Matsunaga, Isao: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Matsunaga, Masaaki: *See*—
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, 4,561,044, Cl. 362-84.000.

Matsuo, Kenji: *See*—
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,560,890, Cl. 307-355.000.

Matsuo, Michiko, Takeshi Matsuo, Tazuko Matsuo, heirs: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,560,508, Cl. 260-239.00A.

Matsuo, Taisuke, deceased (by Matsuo, Michiko, Takeshi Matsuo, Tazuko Matsuo, heirs); Ochiai, Michihiko; and Kishimoto, Shoji, to Takeda Chemical Industries, Ltd. 4-Cyano-2-azetidinones and production thereof. 4,560,508, Cl. 260-239.00A.

Matsuo, Takeshi; and Suzuki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrophotographic photosensitive member using microcrystalline silicon. 4,560,634, Cl. 430-84.000.

Matsuoka, Shunji: *See*—
Nishiwaki, Yoshikazu; Matsuoka, Shunji; and Okamoto, Kenji; 4,560,249, Cl. 350-162.170.

Matsushita, Akira: *See*—
Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, 4,560,684, Cl. 514-221.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ogawa, Kazufumi, 4,560,457, Cl. 204-159.160.
Tanabe, Minoru, 4,561,031, Cl. 360-96.500.
Tanahashi, Takashi; Takai, Mitsuo; and Uemura, Masahito, 4,559,651, Cl. 4-443.000.

Matsushita Electric Works, Ltd.: *See*—
Nagamoto, Mitsuki; and Hashiya, Ikuo, 4,560,966, Cl. 335-80.000.

Matsushita, Hidekatsu, to Matsushita Seiki Kabushiki Kaisha; and Clements Industries, Inc. Device for automatic tying of packages. 4,559,766, Cl. 53-586.000.

Matsushita, Mitsumasa: *See*—
Sato, Shigeyuki; and Matsushita, Mitsumasa, 4,560,716, Cl. 523-451.000.

Matsushita Seiki Kabushiki Kaisha: *See*—
Matsushita, Hidekatsu, 4,559,766, Cl. 53-586.000.

Matsuura, Takeshi: *See*—
Akahane, Naoto; Yamaguchi, Yoshitake; Matsuura, Takeshi; and Watatani, Seiji, 4,561,034, Cl. 360-134.000.

Matsuzaki, Minori: *See*—
Hara, Sohichi; and Matsuzaki, Minori, 4,559,685, Cl. 29-156.50R.

Matsuzawa, Masafumi: *See*—
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.

Mattel, Inc.: *See*—
Renger, Larry H., 4,560,362, Cl. 446-340.000.

Mattera, Adriano: *See*—
Bastioli, Catia; Gianotti, Giuseppe; Mattera, Adriano; and Parrini, Paolo, 4,560,522, Cl. 264-41.000.

Matthews, Anthony: *See*—
Levy, Leon A.; and Matthews, Anthony, 4,559,732, Cl. 40-595.000.

Matthies, Dennis L.: *See*—
Fox, Leonard P.; Datta, Pabitra; Matthies, Dennis L.; and Kawamoto, Hirohisa, 4,561,087, Cl. 369-276.000.

Mauri, Jacinto M.: *See*—
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,560,545, Cl. 423-430.000.

Mause, Elmar: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Mavilor Systemes S.A.: *See*—
Zahner, Pierre W., 4,560,895, Cl. 310-77.000.

May, Jim. Boom suspended wood splitter. 4,559,985, Cl. 144-193.00A.

Mayer, David W.: *See*—
Dahl, Roger W.; and Mayer, David W., 4,559,951, Cl. 128-642.000.

Mayer, Dieter: *See*—
Guttner, Christine; Heilmann, Peter; Kullmann, Udo; Mayer, Dieter; and Grau, Werner, 4,560,624, Cl. 428-632.000.

Mayo, John H. Process of testing blow-out preventer without pulling the wear bushing. 4,559,809, Cl. 73-40.50R.

Mazda Motor Corporation: *See*—
Kido, Yoshinobu, 4,559,913, Cl. 123-352.000.

McCall, John M.; and Lahti, Robert A., to Upjohn Company, The. N-(2-amino-cycloalkenyl)benzeneacetamide and -benzamide analgesics and tritiated kappa agonists therefrom. 4,560,767, Cl. 548-578.000.

McCarthy, Daniel P.: *See*—
Abu-Isa, Ismat A.; Wang, Chen-Shih; McCarthy, Daniel P.; and Patterson, David W., 4,559,688, Cl. 29-157.30R.

McCarthy, James P.; and Byler, Richard E., to Ford Motor Company. Solenoid operated clutch engagement. 4,560,047, Cl. 192-52.000.

McCarty, Kevin F.; and Schrader, Glenn L., to United States of America, Energy. Hydrodesulfurization catalysis by Chevrel phase compounds. 4,560,470, Cl. 208-215.000.

McClure, Richard R., to Butler Manufacturing Company. Hand seamer. 4,559,805, Cl. 72-384.000.

McCombe, Kenneth M.: *See*—
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.

McCormick, Daniel F., to Brunswick Corporation. Marine drive thread mounted pinion. 4,560,355, Cl. 440-86.000.

McCumber, Roger D.; Peterson, Thomas L.; and Lee, Gerry A., to Check Technology Corporation. Document printing method and apparatus. 4,560,293, Cl. 400-61.000.

McDaniel, Max P.: *See*—
Martin nee Sturdy, Shirley J.; and McDaniel, Max P., 4,560,733, Cl. 526-129.000.

McDonald, George H.; and Manatt, Scott A., to Garrett Corporation, The. Oxygen enrichment system. 4,560,394, Cl. 55-16.000.

McDonald, William M.: *See*—
Daughtry, Arthur C.; and McDonald, William M., 4,559,716, Cl. 33-529.000.

McDorman, Thomas W.; and Myers, David K., to Sperry Corporation. Method and apparatus for clamping and balancing rotatable members. 4,561,035, Cl. 360-137.000.

McFadden, Russell T.: *See*—
Pischke, James W.; McFadden, Russell T.; Krause, Ruben L.; and Moore, Charles H., 4,560,736, Cl. 526-312.000.
McFarlan, Alden I. Air conditioning system and method. 4,559,788, Cl. 62-98.000.
McGary, Vernon: *See*—
Taylor, Donald K.; Rogers, William; McGary, Vernon; and Lenart, Peter, 4,559,970, Cl. 137-557.000.
McGettigan, Philip A.: *See*—
Garner, John N.; and McGettigan, Philip A., 4,559,771, Cl. 57-6.000.
McGinnis, Gerald E. Resuscitation apparatus. 4,559,940, Cl. 128-206.260.
McGowan, Gerald F.; Price, Gerald W.; Polhemus, Carl E.; and Ketchum, Ronald L., to Lear Siegler, Inc. Situ multi-channel combustion gas analyzer. 4,560,873, Cl. 250-339.000.
McKee, Kevin D., to Deere & Company. Transmission controller. 4,561,055, Cl. 364-424.100.
McKeown, James H. A., to British Telecommunications. Multi-channel cross-talk interference reduction circuit using modulation-multiplying-demodulation correlator. 4,561,067, Cl. 364-819.000.
McLennan, George A.: *See*—
Huebotter, Paul R.; and McLennan, George A., 4,560,533, Cl. 376-367.000.
McMackins, Dudley E.: *See*—
Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., 4,560,775, Cl. 549-326.000.
McMillen, James M.; and Mullins, Lynn D., to Mobil Oil Corporation. Solvent stimulation in heavy oil wells producing a large fraction of water. 4,560,003, Cl. 166-305.100.
McMillin, John R.; and Strandwitz, Peter, to Cornelius Company, The. Apparatus for dispensing a carbonated beverage. 4,560,089, Cl. 222-14.000.
McMurtry, David R. Method of and apparatus for measuring distance in numerically controlled machine tools. 4,561,058, Cl. 364-474.000.
McNeely, Branch M., Jr. Drill collar structure for use in deviated well bore drilling. 4,560,012, Cl. 175-61.000.
McNeely, Ronald K., to RCA Corporation. Optical alignment for workpiece. 4,560,274, Cl. 356-154.000.
Meador, John: *See*—
Renger, Herman L.; Mann, Brian M.; and Meador, John, 4,559,947, Cl. 128-419.0PG.
Measures, Ernest R.: *See*—
Crupi, Franco A.; Bzowski, Christopher; and Measures, Ernest R., 4,559,922, Cl. 126-271.20A.
Mechanical Technology Incorporated: *See*—
Brown, Alec T., 4,559,779, Cl. 60-517.000.
Medical Research Associates Ltd. #2: *See*—
Andrews, Winston A.; and Carpenter, Larry, 4,559,671, Cl. 16-111.00R.
Meeder, Raymond L., to Siemens Gammasonics, Inc. Detector head mounting apparatus. 4,560,876, Cl. 250-363.00S.
Meguro, Satoshi: *See*—
Yoh, Kanji; Yamashiro, Osamu; and Meguro, Satoshi, 4,559,694, Cl. 29-571.000.
Mehnert, Gottfried: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,560,340, Cl. 425-526.000.
Meier, Horst: *See*—
Bode, Gunter; Meier, Horst; and Engler, Manfred, 4,559,763, Cl. 53-527.000.
Meier, Paul J., to Eaton Corporation. Compact step tuned filter. 4,560,964, Cl. 333-202.000.
Meier, Pierre-Andre : *See*—
Cornu, Roger; and Meier, Pierre-Andre , 4,560,926, Cl. 324-158.00P.
Meiji Seika Kaisha Ltd.: *See*—
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, 4,560,750, Cl. 544-21.000.
Meisenheimer, William L., to Water Jet Corporation. Apparatus for integrating a plurality of audio systems. 4,560,838, Cl. 179-81.00R.
Melamine Chemicals, Inc.: *See*—
Allan, G. Graham; Freepons, Donald E.; and Crews, George M., 4,560,400, Cl. 71-29.000.
Melchior, Bernd, to BM Chemie Kunststoff GmbH. Aggregate for concrete or mortar. 4,560,411, Cl. 106-90.000.
Melnyk, George, to International Business Machines Corporation. Position detector apparatus and method utilizing damped oscillations. 4,560,929, Cl. 324-207.000.
Membrino, Hercules. Double-pocket pad of bags. 4,560,068, Cl. 206-554.000.
Mendes, Luiz N.: *See*—
Franckx, Joris R. I.; Mendes, Luiz N.; van Noten, Lodewijk; and Touchais, Thierry, 4,560,828, Cl. 174-71.00R.
Menig, Helmuth; Fischer, Martin; and Baer, Karl, to BASF Aktiengesellschaft. Preparation of pyrroles. 4,560,769, Cl. 548-560.000.
Merck & Co., Inc.: *See*—
Dybas, Richard A., 4,560,677, Cl. 514-30.000.
Firestone, Raymond A., 4,560,512, Cl. 260-397.200.
Zupan, Jacob A., 4,560,553, Cl. 424-78.000.
Merger, Franz: *See*—
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fouquet, Gerd, 4,560,822, Cl. 585-606.000.
Merkel, Wilfried: *See*—
Ebert, Rolf; Knorreck, Peter; Kramer, Manfred; and Merkel, Wilfried, 4,559,816, Cl. 73-119.00A.
Merrell Dow France et Cie: *See*—
Bey, Philippe; and Jung, Michel, 4,560,795, Cl. 562-561.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, 4,560,700, Cl. 514-423.000.
Merrifield, Robert B., to Rockefeller University, The. N^{α}-desacetylthymosinα_1 and process. 4,560,676, Cl. 514-12.000.
Mestler, Donald C. Convertible table support. 4,560,135, Cl. 248-558.000.
Metal Box p.l.c.: *See*—
Bull, Cyril A., 4,560,313, Cl. 413-1.000.
Metal Closures Limited: *See*—
Herbert, James F., 4,559,759, Cl. 53-308.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Wolf, Heinz; and Emmel, Werner, 4,559,972, Cl. 137-614.110.
Metarplastic S.p.A.: *See*—
Mucelli, Aldo, 4,560,030, Cl. 182-118.000.
Metcalfe, Peter J., to Smith and Nephew Associated Companies p.l.c. Adhesive dressing and components. 4,559,938, Cl. 128-156.000.
Metz, Carl W.: *See*—
Bast, Gordon B.; Metz, Carl W.; and Nicholas, John F., 4,560,831, Cl. 179-2.00E.
Meyer, David R., to Mallinckrodt, Inc. Salt substitute containing potassium chloride, maltodextrin and sodium chloride and method of preparation. 4,560,574, Cl. 426-649.000.
Meyer, Klaus: *See*—
Vom Hofe, Dieter; and Meyer, Klaus, 4,560,085, Cl. 220-465.000.
Meyers, Theodore F., to Hobart Corporation. Dishwashing apparatus. 4,559,959, Cl. 134-56.00D.
Michael, George W., III, to AMP Incorporated. Tool and method for trimming coaxial cable. 4,559,704, Cl. 30-90.100.
Michael Horauf Maschinenfabrik GmbH & Co. KG: *See*—
Muller, Berthold, 4,560,063, Cl. 229-5.500.
Michael, Keil: *See*—
Dietrich, Demus; Horst, Zaschke; Heinz, Altmann; and Michael, Keil, 4,560,496, Cl. 252-299.610.
Mickelson, Roger D., to J. I. Case Company. Multiple compensating unloading valve circuit. 4,559,965, Cl. 137-115.000.
Midland, Richard W., to Zenith Electronics Corporation. Parabolic waveform generator. 4,560,910, Cl. 315-382.000.
Migliori, Albert; and Swift, Gregory W., to United States of America, Energy. Feedback regulated induction heater for a flowing fluid. 4,560,849, Cl. 219-10.510.
Mignon-Media GmbH: *See*—
Murjahn, Waldemar, 4,560,251, Cl. 350-283.000.
Mihara, Takao: *See*—
Murakami, Shinichi; and Mihara, Takao, 4,560,931, Cl. 324-220.000.
Milano, Mario: *See*—
Credali, Lino; Parrini, Paolo; Milano, Mario; and Lori, Domenico, 4,560,429, Cl. 156-208.000.
Miles Laboratories, Inc.: *See*—
Kung, Wei-jen; and Vogelhut, Paul O., 4,560,534, Cl. 422-68.000.
Milgate, Robert W., III: *See*—
Petric, Paul F.; Foley, Michael S.; Waz, John J.; and Milgate, Robert W., III, 4,560,880, Cl. 250-441.100.
Miller, Alistair A.: *See*—
Baxter, Martin G.; Elphick, Albert R.; Miller, Alistair A.; and Sawyer, David A., 4,560,687, Cl. 514-242.000.
Miller, Douglas P., to Applied Power Inc. Swing clamp. 4,560,152, Cl. 269-24.000.
Miller, Peter J. Adjustable grip for bowling ball. 4,560,162, Cl. 273-63.00B.
Miller, Richard A.; and Bucher, George D., to Westinghouse Electric Corp. Pulsed laser machining apparatus. 4,560,856, Cl. 219-121.0LC.
Millet, George H.; Harrell, Edward R.; and Wright, Charles D., to Minnesota Mining and Manufacturing Company. Cyanoacrylate adhesive composition having sustained toughness. 4,560,723, Cl. 524-486.000.
Min, Young K., to PT Components, Inc. Sparkless circuit for low horsepower electronic motor brake. 4,560,913, Cl. 318-760.000.
Minami, Tatsuo, to Nissan Shatai Co., Ltd. Device for guiding a vehicle sliding door. 4,560,197, Cl. 296-155.000.
Minami, Tatsuo: *See*—
Tuchiya, Yoshimasa; and Minami, Tatsuo, 4,559,740, Cl. 49-216.000.
Minami, Yuji; Kamiyama, Hisashi; and Tomita, Toshihide, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for manufacturing solidified radioactive waste. 4,560,501, Cl. 252-628.000.
Minamida, Katsuhiro: *See*—
Takafuji, Hideo; Minamida, Katsuhiro; and Yamaguchi, Shigehiro, 4,560,855, Cl. 219-121.0LD.
Minamida, Kazukiyo, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,560,015, Cl. 177-25.000.
Ministry of International Trade & Industry: *See*—
Nara, Koichi, 4,560,288, Cl. 374-201.000.
Minnesota Mining and Manufacturing Company: *See*—
Brinkley, Robert W., 4,560,487, Cl. 252-8.750.
Millet, George H.; Harrell, Edward R.; and Wright, Charles D., 4,560,723, Cl. 524-486.000.
Sasaki, Makoto, 4,560,587, Cl. 427-152.000.
Siedle, Allen R., 4,560,780, Cl. 556-40.000.

Minolta Camera Kabushiki Kaisha: *See—*
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,560,267, Cl. 354-412.000.
Ogino, Shuji, 4,560,253, Cl. 350-426.000.
Ueda, Hiroshi; Yoshizaki, Akira; and Masaki, Yasuo, 4,560,261, Cl. 354-121.000.

Mioche, Robert, to Compagnie Generale des Etablissements Michelin. Apparatus for obtaining strips from a material, particularly from a latex coagulum. 4,560,338, Cl. 425-308.000.

Mirowski, Mieczyslaw: *See—*
Mower, Morton M., 4,559,946, Cl. 128-419.00D.

Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Oxidation protection coatings for polymers. 4,560,577, Cl. 427-38.000.

Mita, Kikuo: *See—*
Ando, Moritoshi; Mita, Kikuo; and Kakinoki, Yoshikazu, 4,560,273, Cl. 356-237.000.

Mitchell, Crighton M., to Canada, Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources. Stress measurement by X-ray diffractometry. 4,561,062, Cl. 364-555.000.

Mitsubishi Chemical Industries Limited: *See—*
Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,560,793, Cl. 562-414.000.
Hiroki, Ohta; Masatsugu, Oda; and Jun, Kato, 4,560,682, Cl. 514-100.000.
Iwata, Yoshitaka; and Matsuda, Ken, 4,560,623, Cl. 428-626.000.
Murai, Nobuyuki; Nakamichi, Kazuya; Otake, Masayuki; and Ushikubo, Takashi, 4,560,807, Cl. 568-698.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Abe, Norio, 4,561,021, Cl. 358-158.000.
Arimoto, Satomi, 4,560,848, Cl. 200-147.00A.
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, 4,560,329, Cl. 418-47.000.
Ishikawa, Hitoshi; and Kano, Kenji, 4,560,919, Cl. 323-314.000.
Kohara, Masanobu; Nakao, Shin; and Shibata, Hiroshi, 4,561,011, Cl. 356-81.000.
Mori, Teijiro, 4,560,847, Cl. 200-144.00R.
Morishita, Mitsuharu; and Kouge, Shinichi, 4,561,036, Cl. 361-20.000.
Murakami, Tokumichi; and Asai, Kohtaro, 4,560,977, Cl. 340-347.0AD.
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, 4,561,096, Cl. 372-46.000.
Ookawa, Kiyoshi, 4,559,916, Cl. 123-418.000.
Sadamori, Masaaki, 4,559,697, Cl. 29-590.000.
Sasaki, Toshihiko, 4,559,840, Cl. 74-89.210.
Segawa, Hirohisa; Kitani, Motoe; Shimizu, Takao; and Mizuno, Masanori, 4,560,857, Cl. 219-130.210.
Seki, Kimiaki, 4,560,326, Cl. 417-480.000.
Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, 4,560,916, Cl. 322-86.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, 4,560,054, Cl. 192-106.200.
Kijima, Nobuo; and Hasegawa, Yukio, 4,559,895, Cl. 116-200.000.
Tani, Masanori; Eto, Shin'ichi; and Funakoshi, Takeshi, 4,560,210, Cl. 303-22.00R.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.

Mitsubushi Petrochemical Co., Ltd.: *See—*
Iwase, Sumio, 4,560,707, Cl. 521-124.000.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Nishihama, Hideki; and Miyazaki, Kazuhide, 4,560,631, Cl. 429-194.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Tsujimoto, Michihiro; Asano, Makoto; Hasegawa, Kiyoharu; and Akahori, Hiroyuki, 4,561,000, Cl. 346-208.000.

Mitsui, Tsutomu; Tada, Konji; Kuhara, Yoshiki; and Tatsumi, Masami, to Sumitomo Electric Industries, Ltd. Magneto-optical converter utilizing Faraday effect. 4,560,932, Cl. 324-244.000.

Mitsuyoshi, Yokota: *See—*
Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, 4,560,916, Cl. 322-86.000.

Mittelmann, Rudolf: *See—*
Thinschmidt, Hans; and Mittelmann, Rudolf, 4,561,118, Cl. 455-608.000.

Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, to Ajinomoto Company Incorporated. Method for producing L-lysine by fermentation. 4,560,654, Cl. 435-115.000.

Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, to Mitsubishi Gas Chemical Company, Inc. Process for producing oligoesters. 4,560,788, Cl. 560-91.000.

Miyashiro, Shigeyoshi: *See—*
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.

Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, to Nippon Kokan Kabushiki Kaisha. Process for desulfurizing molten steel. 4,560,405, Cl. 75-12.000.

Miyazaki, Kazuhide: *See—*
Nishihama, Hideki; and Miyazaki, Kazuhide, 4,560,631, Cl. 429-194.000.

Miyazawa, Takeshige: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.

Miyoshi, Kunisuke: *See—*
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Hiromae, Yoshitaka, 4,560,423, Cl. 148-111.000.

Mizelle, Ned W. Bedding units and components for such units. 4,559,654, Cl. 5-255.000.

Mizumoto, Muneo: *See—*
Yoshioka, Masahiro; Mizumoto, Muneo; and Yamada, Koichiro, 4,560,325, Cl. 417-407.000.

Mizuno, Masanori: *See—*
Segawa, Hirohisa; Kitani, Motoe; Shimizu, Takao; and Mizuno, Masanori, 4,560,857, Cl. 219-130.210.

Mizuno, Takao: *See—*
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.

Mizuno, Yoshiyuki: *See—*
Toyama, Hiroshige; Mizuno, Yoshiyuki; Yamamoto, Yoshimi; and Kato, Mitsuru, 4,560,115, Cl. 242-107.40A.

Mjoen, Oyvind: *See—*
Brands ter, Helge; Ommundsen, Tor A.; and Mjoen, Oyvind, 4,561,073, Cl. 367-19.000.

Mobil Oil Company: *See—*
Chiang, Alan W., 4,560,712, Cl. 523-220.000.

Mobil Oil Corporation: *See—*
Chu, Chin-Chiun, 4,560,818, Cl. 585-443.000.
Chu, Chin-Chiun, 4,560,819, Cl. 585-445.000.
Herrington, Fox J., 4,561,109, Cl. 383-65.000.
McMillen, James M.; and Mullins, Lynn D., 4,560,003, Cl. 166-305.100.
Park, Hee C., 4,560,614, Cl. 428-317.900.
Pelrine, Bruce P., 4,560,670, Cl. 502-26.000.
Reimann, George J., 4,560,067, Cl. 206-554.000.
Tabak, Samuel A., 4,560,536, Cl. 422-116.000.
Tabak, Samuel A., 4,560,537, Cl. 422-190.000.

Mock, Elmar; and Bron, Alphonse, to ETA S.A., Fabriques d, E bauches. Wrist watch having a bracelet attached to the watch casing by a hinge. 4,561,077, Cl. 368-282.000.

Modsa (Proprietary) Limited: *See—*
De Lange, Jan H.; and Fick, Ernest, 4,559,956, Cl. 131-303.000.

Mohnhaupt, Axel: *See—*
Affeld, Klaus; Mohnhaupt, Axel; and Jorn, Frank, 4,559,648, Cl. 623-3.000.

Moisan, Marius. Snow mover. 4,559,726, Cl. 37-267.000.

Moitzger, Max: *See—*
dePuglia, Gaston D.; Van der Borght, William J.; and Moitzger, Max, 4,560,138, Cl. 249-95.000.

Moksvold, Tor W., to International Business Machines Corporation. Resistor design system. 4,560,583, Cl. 427-88.000.

Molders, Claus, to Badenia GmbH Stepeedeckenfabrik. Method and apparatus for separating a nonwoven stuffing material. 4,559,673, Cl. 19-82.000.

Moldow, Preben G., to 501 P.M. Filter Konstruktionen. Separator for filter cartridges. 4,560,477, Cl. 210-457.000.

Molex Incorporated: *See—*
Dambach, Philip J., 4,560,222, Cl. 339-75.0MP.

Molins Limited: *See—*
Applegate, Barry G.; Carter, David C. M.; and Heybourn, Frank, 4,560,057, Cl. 198-347.000.

Moller, Craig A.; and Wolter, Eric H., to Abar Ipsen Industries. Gas nozzle for a heat treating furnace. 4,560,348, Cl. 432-77.000.

Molloy, James O.; Sydenham, Peter E.; and Hulejczuk, Roman A., to Fisons plc. Fire prevention and extinguishing assembly. 4,560,007, Cl. 169-54.000.

Momma, Tetuo: *See—*
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Momose, Haruo: *See—*
Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, 4,560,654, Cl. 435-115.000.

Monsanto Company: *See—*
Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., 4,560,775, Cl. 549-326.000.
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,560,674, Cl. 502-209.000.

Montedison S.p.A.: *See—*
Bastioli, Catia; Gianotti, Giuseppe; Mattera, Adriano; and Parrini, Paolo, 4,560,522, Cl. 264-41.000.
Credali, Lino; Parrini, Paolo; Milano, Mario; and Lori, Domenico, 4,560,429, Cl. 156-208.000.

Monzer, Helmut, to Hoechst Aktiengesellschaft. Process and device for qualitative and quantitative measurement of irregularities and impuri-

ties on and in transparent or semitransparent flexible sheet materials. 4,560,277, Cl. 356-357.000.

Mookherjee, Braja D.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,791, Cl. 560-254.000.
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,802, Cl. 568-388.000.

Moore, Charles H.: *See*—
Pischke, James W.; McFadden, Russell T.; Krause, Ruben L.; and Moore, Charles H., 4,560,736, Cl. 526-312.000.

Moore, David F.: *See*—
Brown, Karen H.; Moore, David F.; and van der Hoeven, Bernard J. C., Jr., 4,560,435, Cl. 156-643.000.

Mor, Pietro, to Hidroben S.p.A. Componenti ed Impianti Oleodinamici. Single-lever straight-line motion device for single, double and crossed drive on hydraulic pilot devices. 4,559,844, Cl. 74-471.00R.

Moratto, Patricia: *See*—
Smith, Rae; and Moratto, Patricia, 4,559,647, Cl. 2-158.000.

Moraw, Roland; Unger, Manfred; and Walter, Helmut, to Hoechst Aktiengesellschaft. Process for the manufacture of identity cards. 4,560,426, Cl. 156-64.000.

Morduchowitz, Abraham; and Sammells, Anthony F., to Texaco, Inc. Means and method for reducing oxalic acid to a product. 4,560,450, Cl. 204-75.000.

Morgan, Charles R.: *See*—
Siadat, Bahram; and Morgan, Charles R., 4,560,579, Cl. 427-45.100.

Morgan, Lawrence J.: *See*—
Williams, Rodger W.; Atwood, Charles W.; and Morgan, Lawrence J., 4,560,144, Cl. 251-344.000.

Mori, Ichiro: *See*—
Shinozaki, Toshiaki; and Mori, Ichiro, 4,560,278, Cl. 356-364.000.

Mori, Kei. Light transmission control apparatus. 4,560,238, Cl. 350-266.000.

Mori, Kei. Optical filter device. 4,560,252, Cl. 350-315.000.

Mori, Kiyoshi: *See*—
Nakagawa, Masao; Mori, Kiyoshi; and Sugita, Toshiaki, 4,560,735, Cl. 526-232.300.

Mori, Shigeru; and Tarumi, Yasuo, to Shin-Etsu Chemical Co., Ltd. Heat-resistant organopolysiloxane composition. 4,560,784, Cl. 556-401.000.

Mori, Teijiro, to Mitsubishi Denki Kabushiki Kaisha. Power switch. 4,560,847, Cl. 200-144.00R.

Moriguchi, Haruhiko; Inui, Toshiharu; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Thermal head driving method. 4,560,988, Cl. 346-1.100.

Morikawa, Yoshitada: *See*—
Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, 4,560,713, Cl. 523-400.000.

Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Ion beam deposition apparatus. 4,559,901, Cl. 118-723.000.

Morimoto, Tatsuo: *See*—
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.

Morimoto, Yoshiro: *See*—
Murasugi, Takashi; Morimoto, Yoshiro; Suga, Masaaki; and Niikura, Yasuhiro, 4,560,043, Cl. 192-3.310.

Morin, Gerard, to Societe Anonyme D.B.A. Method and apparatus for the manufacture of a ball joint. 4,559,692, Cl. 29-441.00R.

Morinaka, Hideo: *See*—
Tsuzuki, Kenji; and Morinaka, Hideo, 4,560,762, Cl. 546-297.000.

Morioka, Hiroaki: *See*—
Sakakibara, Naoji; Amano, Hiroyuki; Morioka, Hiroaki; and Kawata, Shoji, 4,559,864, Cl. 91-454.000.

Morisawa, Tahei: *See*—
Kitazawa, Toshiyuki; Morisawa, Tahei; and Takahashi, Norimichi, 4,560,264, Cl. 354-219.000.

Morishita, Mitsuharu; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Charging generator controlling device. 4,561,036, Cl. 361-20.000.

Morner, Bengt; Vollertsen, Otto; and Thomsen, Peter, to Sachs-Dolmar GmbH. Brake device for braking the saw chain of a portable motor-driven chain saw. 4,560,040, Cl. 188-77.00R.

Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., to Dow Chemical Company, The. Unitary central cell element for depolarized, filter press electrolysis cells and process using said element. 4,560,452, Cl. 204-98.000.

Mortier, Roy M.: *See*—
Cramp, John H. W.; Murray, Robert T.; Reid, Robert F.; and Mortier, Roy M., 4,560,248, Cl. 350-96.340.

Moskovskoe Vysshee Tekhnicheskoe Uchilische Imeni N. E. Baumana: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Cyclohexane derivatives having plant-growth regulating activities, and uses of these derivatives. 4,560,403, Cl. 71-106.000.

Motomec S.r.l.: *See*—
Mambelli, Giancarlo, 4,560,020, Cl. 180-53.100.

Motomura, Noriyuki; Tsuboi, Hiroyuki; and Yamada, Sadayoshi, to Toshiba Kikai Kabushiki Kaisha. Method and system of controlling injection molding machines. 4,559,991, Cl. 164-457.000.

Motorola, Inc.: *See*—
Bukhman, Yefim; and Thornquist, Steven C., 4,560,436, Cl. 156-643.000.
Dochow, Claude; Patterson, Mark L.; and Sanneman, Richard W., 4,560,987, Cl. 343-17.700.
Duel, Don M.; and Smith, Fred J., 4,559,708, Cl. 33-178.00R.

Mower, Morton M., to Mirowski, Mieczyslaw. Method and apparatus for correcting abnormal cardiac activity by low energy shocks. 4,559,946, Cl. 128-419.00D.

Moyer, James T.: *See*—
Jackowski, Stefan P.; and Moyer, James T., 4,561,094, Cl. 371-24.000.

Mross, Wolf D.: *See*—
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fouquet, Gerd, 4,560,822, Cl. 585-606.000.

Mruk, Norbert J.: *See*—
Vaughan, Raymond C.; DiSabito, David M.; Mruk, Norbert J.; and Eddy, Arthur R., Jr., 4,559,950, Cl. 128-641.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Zimmermann, Horst; and Lorenz, Joachim, 4,560,172, Cl. 277-3.000.

Mucelli, Aldo, to Metarplastic S.p.A. Folding ladder. 4,560,030, Cl. 182-118.000.

Muchowski, Joseph M.; and Unger, Stefan H., to Syntex (U.S.A.) Inc. 5-(4-Vinylbenzoyl)-1,2-dihydro-3H-pyrrolo-[1,2-a]-pyrrole-1-carboxylic acids and derivatives thereof and use as analgesics and anti-inflammatories. 4,560,699, Cl. 514-413.000.

Muir, Ron; and Blokhuis, William, to Witco Chemical Corporation. High performance calcium borate modified overbased calcium sulfonate complex greases. 4,560,489, Cl. 252-33.400.

Muller, Berthold, to Michael Horauf Maschinenfabrik GmbH & Co. KG. Paper container for hot liquids and method and apparatus for making same. 4,560,063, Cl. 229-5.500.

Muller, Erich: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.

Muller, Hanns P.: *See*—
Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, 4,560,738, Cl. 528-62.000.

Muller, Wilhelm: *See*—
Steinberger, Josef; and Muller, Wilhelm, 4,560,179, Cl. 279-15.000.

Mullins, Lynn D.: *See*—
McMillen, James M.; and Mullins, Lynn D., 4,560,003, Cl. 166-305.100.

Munch, Volker: *See*—
Naarmann, Herbert; Munch, Volker; and Penzien, Klaus, 4,560,593, Cl. 427-443.100.

Munn, Robin W.: *See*—
Kim, Tai K.; Munn, Robin W.; Boyer, Carl W.; and Vogt, Martin C., 4,560,539, Cl. 423-59.000.

Murahashi, Tatsuya: *See*—
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,559,888, Cl. 114-74.00R.

Murai, Asao: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.

Murai, Nobuyuki; Nakamichi, Kazuya; Otake, Masayuki; and Ushikubo, Takashi, to Mitsubishi Chemical Industries, Ltd. Process for the production of dimethyl ether useful as a propellant. 4,560,807, Cl. 568-698.000.

Murakami, Hiroyasu: *See*—
Katsuma, Makoto; Murakami, Hiroyasu; and Hiramatsu, Akira, 4,560,263, Cl. 354-195.100.

Murakami, Shinichi; and Mihara, Takao, to Kubota, Ltd. Self-propelled mobile pipeline inspection apparatus and method for inspecting pipelines. 4,560,931, Cl. 324-220.000.

Murakami, Takuya; and Saotome, Masaru, to Nissan Motor Co., Ltd. Power unit supporting structure. 4,560,027, Cl. 180-312.000.

Murakami, Tokumichi; and Asai, Kohtaro, to Mitsubishi Denki Kabushiki Kaisha. Vector quantizer. 4,560,977, Cl. 340-347.0AD.

Murase, Masakazu, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 4,559,954, Cl. 128-736.000.

Murasugi, Takashi; Morimoto, Yoshiro; Suga, Masaaki; and Niikura, Yasuhiro, to Nissan Motor Co., Ltd. Lockup torque converter having slip control means. 4,560,043, Cl. 192-3.310.

Murata, Masami: *See*—
Sonehara, Tomio; Murata, Masami; and Ota, Tadashi, 4,560,982, Cl. 340-784.000.

Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, to Hitachi, Ltd. Scroll device with suction chamber pressure relief. 4,560,330, Cl. 418-55.000.

Murfitt, Raymond G., to Dobson Park Industries Limited. Coal face support. 4,560,306, Cl. 405-295.000.

Murjahn, Waldemar, to Mignon-Media GmbH. Antiglare shield for exterior mirrors. 4,560,251, Cl. 350-283.000.

Murray, Robert J.: *See*—
Davidson, Thomas A.; and Murray, Robert J., 4,560,758, Cl. 546-121.000.
Murray, Robert T.: *See*—
Cramp, John H. W.; Murray, Robert T.; Reid, Robert F.; and Mortier, Roy M., 4,560,248, Cl. 350-96.340.
Musashi Engineering Kabushiki Kaisha: *See*—
Nogi, Hiroyoshi; and Ookawa, Hiroyuki, 4,560,154, Cl. 271-10.000.
Mussati, Werther: *See*—
Berti, Alfredo; Mussati, Werther; and Bruschi, Roberto, 4,560,188, Cl. 285-47.000.
Muto, Osamu: *See*—
Honda, Shoich; Muto, Osamu; and Shirakura, Masaru, 4,559,909, Cl. 123-90.280.
Muto, Takahiko: *See*—
Noda, Munetaka; Muto, Takahiko; Suzuki, Motoyoshi; and Ninoyu, Yutaka, 4,560,024, Cl. 180-176.000.
Myers, David K.: *See*—
McDorman, Thomas W.; and Myers, David K., 4,561,035, Cl. 360-137.000.
Myron Weiss: *See*—
Patty, Charles W.; and Weiss, Myron, 4,559,861, Cl. 84-470.00R.
Naarmann, Herbert; Munch, Volker; and Penzien, Klaus, to BASF Aktiengesellschaft. Deposition of metals on electrically conductive, polymeric carriers. 4,560,593, Cl. 427-443.100.
Nabata, Hiroyuki: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.
Nabisco Brands, Inc.: *See*—
Spiel, Albert, 4,560,573, Cl. 426-622.000.
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, to Stanley Electric Co. Ltd.; and Regie Nationale des Usines Renault. Steering wheel switching circuit. 4,560,885, Cl. 307-10.00R.
Nagahisa, A.: *See*—
Wilson, Stephen R.; Orme-Johnson, W.; and Nagahisa, A., 4,560,557, Cl. 514-178.000.
Nagamoto, Mitsuki; and Hashiya, Ikuo, to Matsushita Electric Works, Ltd.; and SDS-Relais AG. Polarized electromagnet and polarized electromagnetic relay. 4,560,966, Cl. 335-80.000.
Naganawa, Tadahisa; and Matsuda, Yoshihiko, to Toyota Jidosha Kabushiki Kaisha. Method of controlling air-fuel ratio and ignition timing in internal combustion engine and apparatus therefor. 4,559,915, Cl. 123-406.000.
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, to Chugai Seiyaku Kabushiki Kaisha. Method for treating circulatory diseases by using (2-lower alkoxyphenyl)piperazine derivatives. 4,560,686, Cl. 514-255.000.
Nagasaku, Eiichi: *See*—
Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, 4,560,332, Cl. 418-83.000.
Nagata, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Hydraulic pressure modulation device. 4,560,044, Cl. 192-3.570.
Nagumo, Shinichi; Hase, Yoshifumi; and Sanezawa, Fumio, to Nissan Motor Co., Ltd. Coolant temperature control system of internal combustion engine. 4,560,104, Cl. 236-34.500.
Naito, Hideki; and Sato, Kozo, to Fuji Photo Film Co. Ltd. Heat-developable light-sensitive materials with shifted dyes. 4,560,644, Cl. 430-351.000.
Naito, Michinori, to Trio Kabushiki Kaisha. Distortion canceller for FM receiver. 4,561,113, Cl. 455-205.000.
Naka, Yasushi; and Kawakami, Kiyoshi, to Toray Industries, Incorporated. Moisture-permeable waterproof coated fabric. 4,560,611, Cl. 428-266.000.
Nakae, Kiyohiko: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.
Nakae, Taiji; and Ryo, Eisaku, to Fujirebio Kabushiki Kaisha. Method of measuring membrane fusion. 4,560,665, Cl. 436-172.000.
Nakagawa, Kenji: *See*—
Yoshida, Masahiro; and Nakagawa, Kenji, 4,560,666, Cl. 501-5.000.
Nakagawa, Masao; Mori, Kiyoshi; and Sugita, Toshiaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing copolymer. 4,560,735, Cl. 526-232.300.
Nakagawa, Shuta: *See*—
Okazaki, Toshimasa; and Nakagawa, Shuta, 4,560,461, Cl. 204-252.000.
Nakagawa, Takeo: *See*—
Tezuka, Yoshitomo; Nakagawa, Takeo; and Kobayashi, Kazusuke, 4,560,622, Cl. 428-599.000.
Nakahata, Kimio: *See*—
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system operable by carrying data from a camera accessory to a camera body. 4,560,267, Cl. 354-412.000.
Nakai, Yasuo: *See*—
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, 4,559,888, Cl. 114-74.00R.
Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,560,765, Cl. 548-194.000.
Nakajima, Akira: *See*—
Takamura, Yoshio; and Nakajima, Akira, 4,561,048, Cl. 363-60.000.
Nakajima Seisakusho Co., Ltd.: *See*—
Nakajima, Shigeo, 4,559,756, Cl. 53-75.000.
Nakajima, Shigeo, to Nakajima Seisakusho Co., Ltd. Apparatus for packing powdered materials into sack having sealing member. 4,559,756, Cl. 53-75.000.
Nakajima, Tunetaka: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.
Nakamichi, Kazuya: *See*—
Murai, Nobuyuki; Nakamichi, Kazuya; Otake, Masayuki; and Ushikubo, Takashi, 4,560,807, Cl. 568-698.000.
Nakamura, Kousuke: *See*—
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, 4,561,010, Cl. 357-74.000.
Nakamura, Shunji: *See*—
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.
Nakamura, Takeshi: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.
Nakamura, Tsutomu; and Itoh, Kunio, to Shin-Etsu Chemical Co., Ltd. Flame retardant polyolefin-based rubber composition. 4,560,719, Cl. 524-269.000.
Nakane, Kazuhiro: *See*—
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, 4,560,329, Cl. 418-47.000.
Nakanishi, Masayuki: *See*—
Ikegaki, Makoto; Nakanishi, Masayuki; Sato, Humiyuki; and Hashimoto, Tokuo, 4,560,900, Cl. 313-479.000.
Nakao, Shin: *See*—
Kohara, Masanobu; Nakao, Shin; and Shibata, Hiroshi, 4,561,011, Cl. 356-81.000.
Nakarai, Toyoaki: *See*—
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.
Nakata, Kazuo; Ishikawa, Tsuneo; Amamoto, Taro; and Kawamura, Toshihiko, to Ishihara Sangyo Kaisha, Ltd. Process for the preparation of acicular α-FeOOH for magnetic recording materials. 4,560,544, Cl. 423-266.000.
Nakata, Kiyotomo: *See*—
Yoshida, Toshimi; Nakata, Kiyotomo; Masaoka, Isao; and Itow, Hisawo, 4,560,407, Cl. 75-128.00N.
Nakatani, Masayuki: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,559,963, Cl. 137-1.000.
Nakayama, Mitsuhisa, to U.S. Philips Corporation. Disc changer and disc holder and box for use with such a changer. 4,561,078, Cl. 369-38.000.
Namai, Akihiro; and Suzuki, Ryoichi, to Canon Kabushiki Kaisha. Camera. 4,560,266, Cl. 354-400.000.
Namioka, Kazuhiko: *See*—
Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, 4,560,415, Cl. 106-286.300.
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Buried semiconductor laser avoiding thyristor action. 4,561,096, Cl. 372-46.000.
Naniwa Products Co.: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,559,989, Cl. 164-228.000.
Nankaisangyo Co. Ltd.: *See*—
Sato, Takeshi, 4,560,434, Cl. 156-474.000.
Nanko, Hideaki: *See*—
Asao, Motoaki; and Nanko, Hideaki, 4,561,100, Cl. 375-99.000.
Naples, Daniel F.: *See*—
Daniels, Ben G.; Hall, Nicholas E.; Naples, Daniel F.; and Schnell, Albert C., 4,559,760, Cl. 53-314.000.
Nara, Koichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Thermometer for measuring cryogenic temperatures. 4,560,288, Cl. 374-201.000.
Naraoka, Tadashi: *See*—
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, 4,560,640, Cl. 430-280.000.
Narimatsu, Hiroki; Sakamoto, Kenshi; Edayoshi, Tomoko; and Kubota, Hayato, to Fuji Oil Company, Limited. Method of making cheese like food. 4,560,560, Cl. 426-38.000.
Narr, Berthold: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.
Narumi, Ichiro, to Pioneer Electronic Corporation. Support structure of an optical part. 4,561,079, Cl. 369-44.000.
Narumiya, Tsuneaki, to Bridgestone Tire Co., Ltd. Porous ceramic article. 4,560,478, Cl. 210-496.000.
Naruo, Kyoichi: *See*—
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,560,616, Cl. 428-423.100.
National Distillers and Chemical Corporation: *See*—
Staker, Donald D.; and Kain, William S., 4,560,497, Cl. 252-392.000.

National Research Development Corp.: *See*—
Carruthers, John, 4,560,008, Cl. 171-14.000.
National Semiconductor Corporation: *See*—
Yamatake, Mineo, 4,560,921, Cl. 323-316.000.
Naturin-Werk Becker & Company: *See*—
Erk, Gayyur; and Korlatzki, Rudi, 4,560,520, Cl. 264-22.000.
Neale, Reginald L.: *See*—
Langford, Edward A.; Neale, Reginald L.; and James, Stephen R., 4,559,803, Cl. 72-354.000.
NEC Corporation: *See*—
Arakawa, Takeshi; and Ikeda, Hiroki, 4,561,072, Cl. 365-230.000.
Matsuda, Akio, 4,561,020, Cl. 358-134.000.
Tsuzuki, Mitsuo, 4,561,025, Cl. 358-298.000.
Neder, Gunter: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Needham, Arthur M., to Tectron (ENG) Ltd. Testing device for fuel injectors. 4,559,815, Cl. 73-119.00A.
Needham, Donald G.; and Leland, John E., to Phillips Petroleum Company. Process for encapsulating articles with optional laser printing. 4,560,580, Cl. 427-53.100.
Negus, Paul D.; Ng, Tak C.; Badge, Roger; and Cowen, David W., to Westinghouse Brake & Signal Co. Ltd. F.M. demodulator with fail-safe features. 4,560,943, Cl. 329-103.000.
Neider, Thomas M.: *See*—
Klein, Edward P.; and Neider, Thomas M., 4,560,440, Cl. 162-263.000.
Neiman S.A.: *See*—
Neyret, Guy, 4,561,116, Cl. 455-603.000.
Nejigaki, Kazumi: *See*—
Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, 4,560,737, Cl. 527-72.000.
Nelson, Craig E., to TAB Leasing. Precision source of acoustic radiation. 4,559,826, Cl. 73-632.000.
Nelson, Robert S.: *See*—
Barbaric, Zoran L.; and Nelson, Robert S., 4,560,882, Cl. 250-487.100.
Nethe, Frank R.: *See*—
Nethe, Hans W.; and Nethe, Frank R., 4,560,588, Cl. 427-215.000.
Nethe, Hans W.; and Nethe, Frank R., to Degussa Aktiengesellschaft. Method of consolidating sand. 4,560,588, Cl. 427-215.000.
Neuenschwander, Victor L. Scotch yoke piston and crankshaft connection with floating crank pin. 4,559,838, Cl. 74-50.000.
Neumeister, Alexander; and Herold, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Dispenser for metering dental compositions. 4,560,352, Cl. 433-90.000.
Nevitt, Thomas D.: *See*—
Hopkins, P. Donald; Nevitt, Thomas D.; and Unmuth, Eugene E., 4,560,469, Cl. 208-110.000.
New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J., 4,559,722, Cl. 36-89.000.
Newendorp, Bruce C.; Sturtz, Terry L.; and Anderson, Lawrence V., to Deere & Company. Steering pressure-responsive differential lock control system. 4,559,847, Cl. 74-710.500.
Newman, Stephen D.: *See*—
Urrea, Peter D.; Doris, Geoffrey W.; and Newman, Stephen D., 4,559,897, Cl. 118-406.000.
Neyret, Guy, to Neiman S.A. Optical remote-control device for a residence door. 4,561,116, Cl. 455-603.000.
Ng, Tak C.: *See*—
Negus, Paul D.; Ng, Tak C.; Badge, Roger; and Cowen, David W., 4,560,943, Cl. 329-103.000.
NGK Insulators, Ltd.: *See*—
Matsuhiro, Keiji; and Matsui, Minoru, 4,560,669, Cl. 501-97.000.
Soma, Takao; and Matsui, Minoru, 4,559,824, Cl. 73-432.00R.
Nguyen, Thinh; Wiaux, Jean-Pol; and Vance, Christopher J., to EL-TECH Systems Corporation. Method of electroplating, electroplated coating and use of the coating. 4,560,446, Cl. 204-58.500.
Nguyen, Tuan A.: *See*—
Smith, Eugene F.; and Nguyen, Tuan A., 4,559,801, Cl. 72-348.000.
Nicholas, John F.: *See*—
Bast, Gordon B.; Metz, Carl W.; and Nicholas, John F., 4,560,831, Cl. 179-2.00E.
Nicholson, Robert D., to Bardle Servovalve Company. Electromagnetic positioner for a servovalve or the like. 4,560,969, Cl. 335-272.000.
Nickl, Josef: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.
Nicksic, Stephen W.; and Starke, George W., to Chevron Research Company. Well logging method using electron spin resonance signals from hydrocarbon crude. 4,560,663, Cl. 436-25.000.
Nielsen, Grethe C.; Diers, Ivan V.; Outtrup, Helle; and Norman, Barrie E., to Novo Industri A/S. Debranching enzyme product, preparation and use thereof. 4,560,651, Cl. 435-95.000.
Nielsen, Kenneth A., to Union Carbide Corporation. Electrolytic process for the production of alkene oxides. 4,560,451, Cl. 204-79.000.
Niikura, Yasuhiro: *See*—
Murasugi, Takashi; Morimoto, Yoshiro; Suga, Masaaki; and Niikura, Yasuhiro, 4,560,043, Cl. 192-3.310.
Nike, Inc.: *See*—
Norton, Daniel E., 4,559,724, Cl. 36-129.000.
Nilsson, Sven W., to SKF Nova AB. Coupling member for mechanism for converting linear to rotary motion. 4,559,843, Cl. 74-451.000.
Ninoyu, Yutaka: *See*—
Noda, Munetaka; Muto, Takahiko; Suzuki, Motoyoshi; and Ninoyu, Yutaka, 4,560,024, Cl. 180-176.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yamazaki, Shohei, 4,561,080, Cl. 369-45.000.
Yokoyama, Kenji, 4,560,946, Cl. 330-149.000.
Nippon Hodo Co., Ltd.: *See*—
Kikegawa, Shinko; Arai, Takao; Yamamoto, Norio; and Ozaki, Kiyoharu, 4,560,414, Cl. 106-281.00R.
Nippon Kogaku K.K.: *See*—
Terasawa, Hidenori, 4,560,243, Cl. 350-469.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Kato, Kenji, 4,560,495, Cl. 252-186.230.
Nippon Steel Corporation: *See*—
Ikehara, Yasunobu; Ariyoshi, Haruki; and Hidaka, Ryoichi, 4,560,406, Cl. 75-30.000.
Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Hiromae, Yoshitaka, 4,560,423, Cl. 148-111.000.
Takafuji, Hideo; Minamida, Katsuhiro; and Yamaguchi, Shigehiro, 4,560,855, Cl. 219-121.0LD.
Nippon Telegraph & Telephone Public Corporation: *See*—
Atsugi, Takeo; Samejima, Shuuichi; and Masamura, Tatsurou, 4,561,099, Cl. 375-97.000.
Kozono, Shigeru; and Ishikawa, Keiichi, 4,561,114, Cl. 455-226.000.
Nippon Tensaiseito Kabushiki Kaisha: *See*—
Yamada, Yasutsugu, 4,560,619, Cl. 428-541.000.
Nippon Zeon Co. Ltd.: *See*—
Watanabe, Noboru; and Kubo, Yoichiro, 4,560,729, Cl. 525-233.000.
Nippondenso Co., Ltd.: *See*—
Noda, Munetaka; Muto, Takahiko; Suzuki, Motoyoshi; and Ninoyu, Yutaka, 4,560,024, Cl. 180-176.000.
Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, 4,560,332, Cl. 418-83.000.
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, to Omron Tateisi Electronics Co. Illuminated display assembly. 4,561,045, Cl. 362-368.000.
Nishi, Toshihiro: *See*—
Takagi, Shigehide; Yokota, Norio; Sato, Syohei; and Nishi, Toshihiro, 4,560,413, Cl. 106-120.000.
Nishida, Hisato: *See*—
Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, 4,560,198, Cl. 296-185.000.
Nishihama, Hideki; and Miyazaki, Kazuhide, to Mitsui Mining & Smelting Co., Ltd. Organic electrolyte cells. 4,560,631, Cl. 429-194.000.
Nishihata, Ken: *See*—
Atsumi, Kunio; Katano, Kiyoaki; Kai, Fumio; Nishihata, Ken; and Akita, Eiichi, 4,560,750, Cl. 544-21.000.
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, to Victor Company of Japan, Ltd. Memory circuit write-in system. 4,561,083, Cl. 369-59.000.
Nishimatsu, Masaharu; Kubota, Yuichi; Tamazaki, Kazunori; and Shimada, Shigeru, to TDK Corporation. Magnetic recording medium. 4,560,617, Cl. 428-423.100.
Nishimori, Sinji, to Ebara Corporation. Strainer for submergible pump. 4,560,476, Cl. 210-416.100.
Nishimura, Fuminobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus with pretransfer discharger. 4,560,268, Cl. 355-3.00R.
Nishimura, Tomohiro: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,560,625, Cl. 428-654.000.
Nishisaka, Tsuyoshi: *See*—
Sugino, Kenji; Sugino, Yoshifiiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.
Nishiwaki, Yoshikazu; Matsuoka, Shunji; and Okamoto, Kenji, to Sumitomo Electric Industries, Ltd. Method of forming diffraction gratings and optical branching filter elements produced thereby. 4,560,249, Cl. 350-162.170.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,559,907, Cl. 123-41.120.
Kanamori, Hiroshi, 4,560,597, Cl. 428-31.000.
Kubota, Hitoshi, 4,560,208, Cl. 303-6.00C.
Murakami, Takuya; and Saotome, Masaru, 4,560,027, Cl. 180-312.000.
Murasugi, Takashi; Morimoto, Yoshiro; Suga, Masaaki; and Niikura, Yasuhiro, 4,560,043, Cl. 192-3.310.
Nagumo, Shinichi; Hase, Yoshifumi; and Sanezawa, Fumio, 4,560,104, Cl. 236-34.500.
Suzuki, Kunihiko; and Enomoto, Koji, 4,560,025, Cl. 180-247.000.
Taguchi, Hiromi, 4,559,842, Cl. 74-336.500.
Tuchiya, Yoshimasa; and Minami, Tatsuo, 4,559,740, Cl. 49-216.000.
Nissan Shatai Co., Ltd.: *See*—
Minami, Tatsuo, 4,560,197, Cl. 296-155.000.
Nisshin Engineering Co., Ltd.: *See*—
Yamada, Yukiyoshi; and Yasuguchi, Masayuki, 4,560,471, Cl. 209-144.000.

Nisshin Flour Milling Co. Ltd.: *See*—
Yamada, Yukiyoshi; and Yasuguchi, Masayuki, 4,560,471, Cl. 209-144.000.
Nitrotec Corporation: *See*—
Way, James, 4,560,393, Cl. 55-5.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, 4,560,713, Cl. 523-400.000.
Niven, Jeffrey E.; and Hsieh, Der-Chang, to Burroughs Corporation. Mirror position sensor and associated pivot suspension for improved track selection in optical data disk system. 4,560,925, Cl. 324-97.000.
Nocerino, Grace L. Drapery tieback assembly. 4,559,988, Cl. 160-349.00D.
Noda, Munetaka; Muto, Takahiko; Suzuki, Motoyoshi; and Ninoyu, Yutaka, to Nippondenso Co., Ltd. Automatic running speed control for automotive vehicles. 4,560,024, Cl. 180-176.000.
Nogi, Hiroyoshi; and Ookawa, Hiroyuki, to Musashi Engineering Kabushiki Kaisha. Paper sheet feed-out device for a paper sheet counting apparatus. 4,560,154, Cl. 271-10.000.
Nolde, Wolfgang: *See*—
Janta, Dieter; and Nolde, Wolfgang, 4,560,942, Cl. 329-101.000.
Nomura, Hirokazu: *See*—
Ueno, Susumu; and Nomura, Hirokazu, 4,560,458, Cl. 204-165.000.
Nonaka, Toshihiko; and Toda, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Instrument panel device for vehicles. 4,559,868, Cl. 98-2.080.
Nordberg, Robert B., to Magnetic Peripherals Inc. Flatness measuring apparatus. 4,560,924, Cl. 324-61.00R.
Norddeutsche Affinerie AG: *See*—
Ploss, Hartmut, 4,560,702, Cl. 514-493.000.
Nordson Corporation: *See*—
Cobbs, Walter H., Jr., 4,560,594, Cl. 428-1.000.
Norman, Barrie E.: *See*—
Nielsen, Grethe C.; Diers, Ivan V.; Outtrup, Helle; and Norman, Barrie E., 4,560,651, Cl. 435-95.000.
North American Philips Corporation: *See*—
Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,560,908, Cl. 315-219.000.
North, Thomas. Zodiac board game. 4,560,169, Cl. 273-242.000.
Northern Telecom Limited: *See*—
Garner, John N.; and McGettigan, Philip A., 4,559,771, Cl. 57-6.000.
Schneider, John C., 4,560,887, Cl. 307-66.000.
Walling, Jorg-Hein; Arbuthnot, Gerald; and Shannon, Michael A., 4,560,521, Cl. 264-24.000.
Norton, Daniel E., to Nike, Inc. Track shoe with a improved sole. 4,559,724, Cl. 36-129.000.
Norton, Edward J., to New Balance Athletic Shoe, Inc. Construction of upper for athletic shoe. 4,559,722, Cl. 36-89.000.
Noshay, Allen: *See*—
Gross, Laurence H.; and Noshay, Allen, 4,560,671, Cl. 502-105.000.
Noujaim, Sharbel E.: *See*—
Welles, Kenneth B., II; and Noujaim, Sharbel E., 4,560,941, Cl. 329-50.000.
Novatome: *See*—
Pierrey, Jean-Louis; and Thevenin, Michel, 4,560,530, Cl. 376-290.000.
Novikov, Vladimir V.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Novo Industri A/S: *See*—
Nielsen, Grethe C.; Diers, Ivan V.; Outtrup, Helle; and Norman, Barrie E., 4,560,651, Cl. 435-95.000.
Nukem GmbH: *See*—
Hackstein, Karl; Hrovat, Milan; Schmidt-Hansberg, Thomas; Rachor, Lothar; and Huschka, Hans, 4,560,502, Cl. 252-628.000.
Nusbaum, Arthur, to Nusbaum, Robert; Nusbaum, Howard; and Selick, Barbara. Underfloor assembly and cable distribution system therefor. 4,559,749, Cl. 52-221.000.
Nusbaum, Howard: *See*—
Nusbaum, Arthur, 4,559,749, Cl. 52-221.000.
Nusbaum, Robert: *See*—
Nusbaum, Arthur, 4,559,749, Cl. 52-221.000.
Nutt, Phillip: *See*—
Hamy, Norbert; Nutt, Phillip; and Sheridan, Douglas, 4,559,723, Cl. 36-102.000.
N.V. Nederlandsche Apparatenfabriek Nedap: *See*—
Harmsen, Jan H., 4,559,904, Cl. 119-51.00R.
Nylund, Theodore W.: *See*—
Barry, Robert F.; Delzell, Susan C.; Wilson, John F.; and Nylund, Theodore W., 4,560,532, Cl. 376-434.000.
Obara, Hideo: *See*—
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,560,295, Cl. 400-637.100.
Oberhans, Johann, to Dr. Johannes Heidenhain GmbH. Error correction system for length measuring device. 4,559,707, Cl. 33-125.00C.
Oberstrass, Detlev, to Barmag Barmer Maschinenfabrik AG. Friction yarn false twisting apparatus. 4,559,775, Cl. 57-340.000.
Occidental Chemical Corporation: *See*—
Foster, Arthur M., 4,560,794, Cl. 562-467.000.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,560,205, Cl. 299-2.000.
Ricketts, Thomas E., 4,560,206, Cl. 299-2.000.
Ochiai, Michihiko: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,560,508, Cl. 260-239.00A.
Oculus Optikgeraete GmbH: *See*—
Reiner, Josef, 4,560,255, Cl. 350-503.000.
O'Dell, Leonard J., to Allis-Chalmers Corporation. Down flow filter panel dust collector. 4,560,396, Cl. 55-287.000.
Oeckl, Siegfried; Schmitt, Hans-Georg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal alkylene(cycloalkylene)-bis-heterocyclyl-biguanides. 4,560,694, Cl. 514-359.000.
Officine Meccaniche Veronesi SpA (O.M.V.): *See*—
Padovani, Pietro, 4,560,339, Cl. 425-437.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Adhesives for bonding optical elements. 4,560,457, Cl. 204-159.160.
Ogawa, Toshio: *See*—
Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, 4,560,404, Cl. 75-0.50C.
Ogg, Robert D., to Alpha Ocean Systems, Inc. Shank for an anchor structure. 4,559,893, Cl. 114-304.000.
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, to Hitachi, Ltd. Electrically insulating silicon carbide sintered body. 4,561,010, Cl. 357-74.000.
Ogino, Shuji, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,560,253, Cl. 350-426.000.
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, to Citizen Watch Co., Ltd. Lighting device for a display panel of an electronic device. 4,561,044, Cl. 362-84.000.
Oh, Seibang, to Littelfuse, Inc. Spiral wound shunt type slow blow fuse. 4,560,971, Cl. 337-164.000.
O'Hara, Stephen G., to Phillips Petroleum Company. Vessel with high pressure feedthru. 4,560,232, Cl. 339-268.00R.
Ohashi, Hajime: *See*—
Iguchi, Hideaki; Sakai, Takayoshi; and Ohashi, Hajime, 4,561,050, Cl. 364-167.000.
Ohba, Yasuhiro: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.
Ohkawa, Tihiro, to GA Technologies Inc. Method and apparatus for producing average magnetic well in a reversed field pinch. 4,560,528, Cl. 376-121.000.
Ohkura, Zenichi; and Kohmoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens driving apparatus in cameras. 4,560,237, Cl. 350-255.000.
Ohmori, Takashi: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; and Ohmori, Takashi, 4,560,988, Cl. 346-1.100.
Ohmura, Takao: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.
Ohorodnik, Alexander: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,560,518, Cl. 260-970.000.
Oida, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. High-speed ECL synchronous logic circuit with an input logic circuit. 4,560,888, Cl. 307-272.00A.
Oilgear Company, The: *See*—
Hornsby, Carlton R., 4,560,309, Cl. 408-229.000.
Oishi, Keiji: *See*—
Fukuchi, Masakazu; Oishi, Keiji; and Iwai, Yasuyuki, 4,559,898, Cl. 118-653.000.
Oka, Yoshitami: *See*—
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,560,642, Cl. 430-313.000.
Okamoto, Kenji: *See*—
Nishiwaki, Yoshikazu; Matsuoka, Shunji; and Okamoto, Kenji, 4,560,249, Cl. 350-162.170.
Okamura, Masayoshi: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.
Okano, Hiroshi: *See*—
Tamura, Hifumi; Okano, Hiroshi; Ishitani, Tohru; and Shimase, Akira, 4,560,907, Cl. 315-111.010.
Okanobu, Taiwa, to Sony Corporation. Voltage to current converting circuit. 4,560,920, Cl. 323-315.000.
Okazaki, Toshimasa; and Nakagawa, Shuta, to Toagosei Chemical Industry Co., Ltd. Electrolytic cell for use in electrolysis of aqueous alkali metal chloride solutions. 4,560,461, Cl. 204-252.000.
Oki Electric Industry Co., Ltd.: *See*—
Tadokoro, Hideo, 4,559,718, Cl. 34-8.000.
Oki, Takeo; and Ichikawa, Katsutoshi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Opening and closing device for retractable nib fountain pen. 4,560,298, Cl. 401-107.000.
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium having binder cured by electron beam radiation. 4,560,616, Cl. 428-423.100.
Okumura, Masatoshi, to Shin Nisso Kako Co., Ltd. Process for preparing molded silicon carbide product. 4,560,526, Cl. 264-328.200.

Okuno, Kenji: *See*—
Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, 4,560,715, Cl. 523-443.000.
Okushita, Masataka, to Dai Nippon Insatsu Kabushiki Kaisha. Bag-in-box package. 4,560,090, Cl. 222-81.000.
Olander, Donald E.; and Hyyppa, Juho, to Hi-Shear Corporation, by said Donald E. Olander. $LiClO_4$ Containing propellant compositions. 4,560,425, Cl. 149-19.910.
Oledal, Bo J. M.: *See*—
Svensson, Sven A.; Oledal, Bo J. M.; and Lofgren, Stig-Gunnar E., 4,559,986, Cl. 144-208.00B.
Olin, Daniel C.: *See*—
Jackson, Ronald M.; Olin, Daniel C.; and Anderson, Russell Y., 4,560,981, Cl. 340-747.000.
Olive, Graham: *See*—
Eastman, Dean E.; Eldridge, Jerome M.; Petersen, Kurt E.; and Olive, Graham, 4,561,040, Cl. 361-385.000.
Ollivier, Jean-Paul; and Vinatier, Bernard, to Atochem. Composite material. 4,560,613, Cl. 428-309.900.
Olschewski, Armin: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Olson, Harlan W.; and Hall, Patrick L. Outboard motor steering control system. 4,559,889, Cl. 114-153.000.
Olsson, Billy E., to AMP Incorporated. High density zero insertion force connector. 4,560,221, Cl. 339-75.0MP.
Oltmanns, Roger W., Jr.: *See*—
Gumkowski, Bert A.; and Oltmanns, Roger W., Jr., 4,560,037, Cl. 188-73.380.
Olver, Terence E., to Westinghouse Electric Corp. Adaptive feedforward cancellation technique that is effective in reducing amplifier harmonic distortion products as well as intermodulation distortion products. 4,560,945, Cl. 330-149.000.
Olympia Werke AG: *See*—
Tillich, Peter, 4,560,980, Cl. 340-727.000.
Olympus Optical Co., Ltd.: *See*—
Shirako, Hideo, 4,561,033, Cl. 360-130.330.
Takayama, Syuichi, 4,559,928, Cl. 128-6.000.
Ommundsen, Tor A.: *See*—
Brands ter, Helge; Ommundsen, Tor A.; and Mjoen, Oyvind, 4,561,073, Cl. 367-19.000.
Omron Tateisi Electronics Co.: *See*—
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,561,045, Cl. 362-368.000.
Onitsuka, Masaaki; and Fujiwara, Kazuyuki, to Toyota Jidosha Kabushiki Kaisha. Connecting pin configuration. 4,560,186, Cl. 280-752.000.
Ono, Seigo: *See*—
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, 4,560,054, Cl. 192-106.200.
Ono, Shigetoshi: *See*—
Toriuchi, Masaharu; and Ono, Shigetoshi, 4,560,645, Cl. 430-562.000.
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for preparing an ether solution of polyamic acids and polyimide resins. 4,560,721, Cl. 524-378.000.
Ookawa, Hiroyuki: *See*—
Nogi, Hiroyoshi; and Ookawa, Hiroyuki, 4,560,154, Cl. 271-10.000.
Ookawa, Junji: *See*—
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, 4,560,785, Cl. 560-52.000.
Ookawa, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus for internal combustion engine. 4,559,916, Cl. 123-418.000.
Oomura, Etsuji: *See*—
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, 4,561,096, Cl. 372-46.000.
Optical Communications Corporation: *See*—
Kuhn, Loughrey R., 4,561,117, Cl. 455-608.000.
Orchard, William R. H. Apparatus for controlling the flow of a fluid. 4,560,323, Cl. 417-27.000.
Orme-Johnson, W.: *See*—
Wilson, Stephen R.; Orme-Johnson, W.; and Nagahisa, A., 4,560,557, Cl. 514-178.000.
O'Rourke, John F.: *See*—
De Boynton, William L.; Lee, Frederick C.; Wilson, Bruce E.; and O'Rourke, John F., 4,559,711, Cl. 33-199.00R.
Orr, Alexander F., to Shell Oil Company. Preparation of 1-benzylazetidin-3-ol. 4,560,507, Cl. 260-239.00A.
Orr, John R.: *See*—
Sita, Richard K.; Orr, John R.; and Waring, John L., 4,561,027, Cl. 360-39.000.
Osaka Kiko Kabushiki Kaisha: *See*—
Koda, Seido, 4,559,710, Cl. 33-178.00E.
Osborne, Neal F., to Beecham Group p.l.c. Synergistic compositions containing 6-alkylidene penems and their use. 4,560,550, Cl. 424-114.000.
Osborne, Travis H. Method of and apparatus for applying dental treatment fluid. 4,560,351, Cl. 433-80.000.
Ostrem, John S.: *See*—
Crane, Hewitt D.; and Ostrem, John S., 4,561,105, Cl. 382-13.000.
Ota, Naoto: *See*—
Ishida, Hiroshi; Fujioka, Yoshiki; and Ota, Naoto, 4,560,927, Cl. 324-166.000.
Ota, Tadashi: *See*—
Sonehara, Tomio; Murata, Masami; and Ota, Tadashi, 4,560,982, Cl. 340-784.000.
Otake, Masayuki: *See*—
Murai, Nobuyuki; Nakamichi, Kazuya; Otake, Masayuki; and Ushikubo, Takashi, 4,560,807, Cl. 568-698.000.
Otema, Martin. Show case. 4,560,214, Cl. 312-114.000.
Otema, Martin. Knock-down geometric structure with optional mirrored faces. 4,560,257, Cl. 350-616.000.
Otis Elevator Company: *See*—
Doane, John C.; and Hardenbrook, David L., 4,561,093, Cl. 371-20.000.
Otsuka Kagaku Kabushiki Kaisha: *See*—
Shono, Tatsuya, 4,560,447, Cl. 204-59.00R.
Ott, Karl-Heinz: *See*—
Eichenauer, Herbert; Doring, Joachim; Ott, Karl-Heinz; and Bottenbruch, Ludwig, 4,560,726, Cl. 525-71.000.
Ott, Paul W.: Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., to Applied Technologies Associates. Azimuth determination for vector sensor tools. 4,559,713, Cl. 33-302.000.
Ottenberg, Lee: *See*—
Ottenberg, Ray, 4,560,559, Cl. 426-19.000.
Ottenberg, Ray, to Ottenberg, Lee, a part interest. Yeast-raisable wheat-based food products that exhibit reduced deterioration in palatability upon exposure to microwave energy. 4,560,559, Cl. 426-19.000.
Outboard Marine Corporation: *See*—
Flaig, John D.; and Taipale, Dale L., 4,559,908, Cl. 123-41.280.
Seyerle, Carl E., 4,559,769, Cl. 56-295.000.
Outtrup, Helle: *See*—
Nielsen, Grethe C.; Diers, Ivan V.; Outtrup, Helle; and Norman, Barrie E., 4,560,651, Cl. 435-95.000.
Ovren, Christer: *See*—
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,560,868, Cl. 250-227.000.
Owen, David J.: *See*—
MacLaine, Colin G.; and Owen, David J., 4,561,037, Cl. 361-228.000.
Owen, Timothy C.; and Witzigman, Charles J., to Westinghouse Electric Corp. Method of constructing a padmounted distribution transformer. 4,559,699, Cl. 29-602.00R.
Owens-Corning Fiberglas Corporation: *See*—
Rapp, Charles F.; Fausey, William H.; and Gonterman, J. Ronald, 4,560,606, Cl. 428-141.000.
Yau, Ben J., 4,560,612, Cl. 428-288.000.
Owens-Corning Fiberglass Corporation: *See*—
Ishler, Michael W., 4,559,746, Cl. 52-2.000.
Oye, Tom. Fish lower lip gripper tool. 4,559,853, Cl. 81-420.000.
Ozaki, Kiyoharu: *See*—
Kikegawa, Shinko; Arai, Takao; Yamamoto, Norio; and Ozaki, Kiyoharu, 4,560,414, Cl. 106-281.00R.
Ozari, Yehuda: *See*—
Gajria, Chandrasen; and Ozari, Yehuda, 4,560,714, Cl. 523-409.000.
Ozawa, Takashi: *See*—
Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihisa; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, 4,560,866, Cl. 250-216.000.
Pace, Renato C.: *See*—
Vanni, Sergio; Guidi, Loris; Vallini, Paolo; Pace, Renato C.; and Scotti, Carlo, 4,560,384, Cl. 8-94.210.
Packard, Paul D.: *See*—
Craig, Robert L.; Hunter, Iain; and Packard, Paul D., 4,561,063, Cl. 364-559.000.
Padovani, Pietro, to Officine Meccaniche Veronesi SpA (O.M.V.). Extracting system for fabricated objects formed by a thermo-forming machine. 4,560,339, Cl. 425-437.000.
Pain Suppression Labs: *See*—
Liss, Saul; and Liss, Bernard, 4,559,948, Cl. 128-419.00R.
Palmer, Marvin K., to Caterpillar Tractor Co. Log skidder vehicle brake system. 4,560,148, Cl. 254-323.000.
Pamont AG: *See*—
Sapper, Richard, 4,560,199, Cl. 297-323.000.
Panett Corporation: *See*—
Burnett, Patricia A., 4,559,649, Cl. 4-144.100.
Paoletti, Jean-Claude, to Laboratoires Merck Sharp & Dohme Chibret. Device for preparing and dispensing a solution. 4,559,983, Cl. 141-260.000.
Papageorgiou, Vassilios P.; Bakola-Christianopoulou, Maria; and Tsipis, Constantinos A., to Research Corporation. Anti-tumor diplatinum coordination compounds. 4,560,782, Cl. 556-137.000.
Papp, John E.; and Reed, Antony S., to Standard Precision, Inc. Three part ball bearing slide with lockable intermediate slide member. 4,560,212, Cl. 308-3.800.
Papuchon, Michel; Arditty, Herve ; and Puech, Claude, to Thomson-CSF. Interferometer device for measurement of magnetic fields and electric current pickup comprising a device of this kind. 4,560,867, Cl. 250-225.000.
Papworth, David B.: *See*—
Rodman, Paul K.; Ardini, Joseph L., Jr.; and Papworth, David B., 4,561,051, Cl. 364-200.000.
Paradis, Joseph R., to Dennison Manufacturing Company. Filament fastener with locking head. 4,559,676, Cl. 24-16.0PB.
Paralyzed Veterans of America: *See*—
Hunter, Kelvin H., Jr., 4,559,659, Cl. 14-71.300.

Park, Hee C., to Mobil Oil Corporation. Non-blocking opaque film. 4,560,614, Cl. 428-317.900.
Parker-Hannifin Corporation: *See*—
Lindsey, Charles T., 4,560,967, Cl. 335-262.000.
Parker & Harper Manufacturing Company, The: *See*—
Massey, Roger G.; and Holloway, David G., 4,559,966, Cl. 137-270.000.
Parkinson, Colin C. A.; and Kinnerly, Anthony G., to British Aerospace Public Limited Company. Power plant attachment arrangements for aircraft wings. 4,560,122, Cl. 244-54.000.
Parks, Beryl H.: *See*—
Radford, Kenneth C.; Keller, Herbert W.; Parks, Beryl H.; and Fuller, Robert R., 4,560,462, Cl. 204-298.000.
Parks, James A.; and Plattner, Jacob J., to Abbott Laboratories. 3-Alkyl-8-chloro-5,6-dihydrofuro-[3,2-f]-1,2-benzisoxazole-6-carboxylic acids. 4,560,558, Cl. 514-379.000.
Parrini, Paolo: *See*—
Bastioli, Catia; Gianotti, Giuseppe; Mattera, Adriano; and Parrini, Paolo, 4,560,522, Cl. 264-41.000.
Credali, Lino; Parrini, Paolo; Milano, Mario; and Lori, Domenico, 4,560,429, Cl. 156-208.000.
Pastor, Stephen D.: *See*—
Spivack, John D.; and Pastor, Stephen D., 4,560,799, Cl. 568-47.000.
Patel, Vipin N., to Harris Corporation. Method for forming integrated circuits bearing polysilicon of reduced resistance. 4,560,422, Cl. 148-33.000.
Pater, Ruth H., to United States of America, Administrator, National Aeronautics and Space Administration. High temperature resistant polyimide from tetra ester, diamine, diester and N-arylnadimide. 4,560,742, Cl. 528-342.000.
Paton, Hugh: *See*—
Mason, Edgar G.; Clark, Harold; and Forsythe, James A., 4,559,902, Cl. 119-2.000.
Patrone, Alberto: *See*—
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, 4,560,546, Cl. 423-607.000.
Patterson, David W.: *See*—
Abu-Isa, Ismat A.; Wang, Chen-Shih; McCarthy, Daniel P.; and Patterson, David W., 4,559,688, Cl. 29-157.30R.
Patterson, Mark L.: *See*—
Dochow, Claude; Patterson, Mark L.; and Sanneman, Richard W., 4,560,987, Cl. 343-17.700.
Patty, Charles W.; and Weiss, Myron, to Myron Weiss. Musical teaching device for expediting musical instruction. 4,559,861, Cl. 84-470.00R.
Paul Forkardt GmbH & Co. KG: *See*—
Steinberger, Josef; and Muller, Wilhelm, 4,560,179, Cl. 279-15.000.
Paul, Werner: *See*—
Schimko, Reinhold; and Paul, Werner, 4,559,791, Cl. 66-75.100.
Paul Wurth S.A.: *See*—
Legille, Edouard; and Lonardi, Emile, 4,559,839, Cl. 74-88.000.
Pavlov, Tudor: *See*—
Servas, Frank; Lewin, John E.; Pavlov, Tudor; and Diettrich, Lambert J., Jr., 4,559,999, Cl. 165-156.000.
Peacock Investments (Proprietary) Limited: *See*—
Raubenheimer, Johann N., 4,560,418, Cl. 134-18.000.
Peck, William, to Hill-Rom Company, Inc. Bed having articulated frame. 4,559,655, Cl. 5-66.000.
Peiffer, Dennis G.: *See*—
Schulz, Donald N.; Peiffer, Dennis G.; Kowalik, Ralph M.; and Kaladas, Jeffrey J., 4,560,710, Cl. 523-175.000.
Peil, William, to General Electric Company. Dual load remote power control for a ceiling fan. 4,560,909, Cl. 315-291.000.
Pelowski, Kenneth R., to Westinghouse Electric Corp. Programmable controller system with failure indicator. 4,560,936, Cl. 324-418.000.
Pelrine, Bruce P., to Mobil Oil Corporation. Method for regeneration of catalysts by removal of nitrogen poisons. 4,560,670, Cl. 502-26.000.
Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,559,668, Cl. 16-35.00R.
Penda Corporation: *See*—
Price, William F.; and Emery, Phillip L., 4,560,195, Cl. 296-1.00S.
Penn Fishing Tackle Mfg. Co.: *See*—
Weber, John A.; and Henze, Herbert O., 4,560,118, Cl. 242-215.000.
Pennwalt Corporation: *See*—
Davidson, Thomas A.; and Murray, Robert J., 4,560,758, Cl. 546-121.000.
Penquite, Charles R.: *See*—
Coleman, James P.; Hallcher, Richard C.; McMackins, Dudley E.; Penquite, Charles R.; and Auvil, Steven R., 4,560,775, Cl. 549-326.000.
Penzien, Klaus: *See*—
Naarmann, Herbert; Munch, Volker; and Penzien, Klaus, 4,560,593, Cl. 427-443.100.
Perkin-Elmer Corporation, The: *See*—
deMey, Charles F., II, 4,560,050, Cl. 192-81.00C.
Harris, Michael D., 4,560,272, Cl. 356-138.000.
Perkins, Walter E., Jr.: *See*—
Knauer, Wolfgang; and Perkins, Walter E., Jr., 4,560,878, Cl. 250-396.00R.
Perl, Julius, to Schlumberger Technology Corporation. Digitizer tablet with coarse and fine position determination. 4,560,830, Cl. 178-19.000.
Pernic, Stanley J.: *See*—
Granzow, Daniel B.; Lueders, Arthur L.; Davis, Ralph L.; Pernic, Stanley J.; Hitchcock, James R., Jr.; and Buckley, Francis D., 4,560,472, Cl. 210-140.000.
Perra, Andrew G., Jr., to Markem Corporation. Printing apparatus using heated ink composition. 4,559,872, Cl. 101-228.000.
Perreau, Alain P.; and Perreau, Jean-Louis, to Sidinter S.A. Device for training to play golf. 4,560,167, Cl. 273-184.00A.
Perreau, Jean-Louis: *See*—
Perreau, Alain P.; and Perreau, Jean-Louis, 4,560,167, Cl. 273-184.00A.
Perret, Rene, to Alsthom-Atlantique. Sound absorbing wall lining. 4,560,028, Cl. 181-288.000.
Perrone, Diego; Patrone, Alberto; and Caffarelli, Elvio, to Luigi Stoppani S.p.A. Chromium hydroxide precipitate obtained by a continuous process for the removal of chromium from waste waters. 4,560,546, Cl. 423-607.000.
Personal Products Company: *See*—
Pieniak, Heinz A., 4,560,372, Cl. 604-369.000.
Pesa, Fred: *See*—
Burrington, James D.; Grasselli, Robert K.; Pesa, Fred; and Maher, Elizabeth A., 4,560,730, Cl. 525-340.000.
Pesa, Frederick: *See*—
Attig, Thomas G.; Graham, Anne M.; and Pesa, Frederick, 4,560,672, Cl. 502-183.000.
Petersen, Kurt E.: *See*—
Eastman, Dean E.; Eldridge, Jerome M.; Petersen, Kurt E.; and Olive, Graham, 4,561,040, Cl. 361-385.000.
Peterson, Bertel R.; and Fortuna, Vincent E., to Vercon, Inc. Carrier for cans. 4,560,064, Cl. 206-159.000.
Peterson, Gerald E.: *See*—
Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., 4,559,661, Cl. 15-93.00R.
Peterson, Richard L.; Johnson, James A.; Scheurer, Roger J.; and Steinberg, Richard W., to Hiniker Company. Cultivator row unit with ridger/bedder implement. 4,560,011, Cl. 172-194.000.
Peterson, Thomas L.: *See*—
McCumber, Roger D.; Peterson, Thomas L.; and Lee, Gerry A., 4,560,293, Cl. 400-61.000.
Petric, Paul F.; Foley, Michael S.; Waz, John J.; and Milgate, Robert W., III, to Varian Associates, Inc. Apparatus for positioning a workpiece in a localized vacuum processing system. 4,560,880, Cl. 250-441.100.
Petrillo, Edward W., Jr.: *See*—
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,560,680, Cl. 514-82.000.
Pettit, George R.; and Herald, Cherry L., to Arizona State University. Macrocyclic lactones. 4,560,774, Cl. 549-267.000.
Pettus, Milton. Food cutting device. 4,559,856, Cl. 83-431.000.
PFD Limited: *See*—
Langford, Edward A.; Neale, Reginald L.; and James, Stephen R., 4,559,803, Cl. 72-354.000.
Pfeifer, Heinrich, to ITT Industries, Inc. Decoder for traffic information regional tone signals. 4,561,115, Cl. 455-228.000.
Pfeiffer, Martin: *See*—
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.
Grimm, Hermann; Volz, Wolfgang; Supper, Ottmar; and Pfeiffer, Martin, 4,560,973, Cl. 338-28.000.
Pfizer Inc.: *See*—
Reiter, Lawrence A., 4,560,690, Cl. 514-256.000.
Richardson, Kenneth; and Whittle, Peter J., 4,560,697, Cl. 514-383.000.
Pforzheimer Uhren-Rohwerke PORTA GmbH & Co.: *See*—
Wehner, Hans-Joachim; and Burkhardt, Wolfgang, 4,561,042, Cl. 362-30.000.
Philipp, Alexander, to C. Nicolai GmbH & Co. KG. Forefoot elevating device for peroneal nerve dysfunction cases. 4,559,934, Cl. 128-80.00E.
Philips Industrial Components, Inc.: *See*—
Van Becelaere, Robert M.; and Bailey, William J., 4,559,867, Cl. 98-1.000.
Phillips, James W.; and Kobos, Duane M., to Dwyer Instruments, Inc. Multipurpose flowmeter arrangement. 4,559,834, Cl. 73-861.550.
Phillips Petroleum Company: *See*—
Banasiak, Dennis S., 4,560,792, Cl. 560-261.000.
Bobsein, Rex L.; and Johnson, Marvin M., 4,560,817, Cl. 585-273.000.
Gaines, Larry D.; and Likins, Merle R., Jr., 4,559,785, Cl. 60-676.000.
Jain, Gyan P., 4,560,442, Cl. 203-2.000.
Kukes, Simon G.; and Johnson, Marvin M., 4,560,466, Cl. 208-89.000.
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; Davis, Thomas; and Efner, Howard F., 4,560,468, Cl. 208-110.000.
Martin nee Sturdy, Shirley J.; and McDaniel, Max P., 4,560,733, Cl. 526-129.000.
Needham, Donald G.; and Leland, John E., 4,560,580, Cl. 427-53.100.
O'Hara, Stephen G., 4,560,232, Cl. 339-268.00R.
Shioyama, Tod K.; and Little, Robert A., 4,560,783, Cl. 556-183.000.
Stapp, Paul R., 4,560,467, Cl. 208-89.000.
Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, to Electricite de France. Process for stabilizing a mixture of molten alkali metal nitrates and alkal. metal nitrites usable particularly as a heat transfer fluid and stabilized mixture thus obtained. 4,559,993, Cl. 165-1.000.
Pieniak, Heinz A., to Personal Products Company. Stable disposable absorbent structure. 4,560,372, Cl. 604-369.000.

Pierce, Aldona M.; and Pierce, Harold D. Beetle attractant. 4,560,551, Cl. 424-84.000.

Pierce, Harold D.: *See—*
Pierce, Aldona M.; and Pierce, Harold D., 4,560,551, Cl. 424-84.000.

Pierpaoli, Piero: *See—*
Bianchi, Gianfranco; Borelli, Riccardo; and Pierpaoli, Piero, 4,559,829, Cl. 73-708.000.

Pierrel, Hans-Joachim, to Siemens Aktiengesellschaft. Telephone station which is main or remotely supplied. 4,560,841, Cl. 179-81.00R.

Pierrel S.p.A.: *See—*
Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, 4,560,662, Cl. 435-253.000.

Pierrey, Jean-Louis; and Thevenin, Michel, to Novatome. Device for providing protection against heat and radiation for an intermediate heat exchanger immersed in a nuclear reactor vessel. 4,560,530, Cl. 376-290.000.

Pilczuk, Eugene A. Musical instrument. 4,559,859, Cl. 84-394.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Oki, Takeo; and Ichikawa, Katsutoshi, 4,560,298, Cl. 401-107.000.

Pimlott, John R.: *See—*
Morris, Gregory J. E.; Grosshandler, Sandor; Beaver, Richard N.; Pimlott, John R.; and Dang, Hiep D., 4,560,452, Cl. 204-98.000.

Pinori, Massimo; and Verdini, Antonio S., to ENI - Ente Nazionale Idrocarburi. Retro-inverso analog of the (5–14) decapeptide of equine angiotensinogen, as a specific renin inhibitor with high resistance to enzymatic hydrolysis. 4,560,505, Cl. 260-112.50R.

Pinsard, Herve ; Collin, Claude; and Faydit, Joel, to Thomson CSF. Clock-frequency recovery device adapted to high-frequency radiocommunications in disturbed media. 4,561,101, Cl. 375-108.000.

Pioneer Electronic Corporation: *See—*
Funabashi, Tadashi, 4,561,085, Cl. 369-77.100.
Narumi, Ichiro, 4,561,079, Cl. 369-44.000.

Pischke, James W.; McFadden, Russell T.; Krause, Ruben L.; and Moore, Charles H., to Dow Chemical Company, The. Water-thinnable coating compositions from aminoalkyl carboxylate hydrohalide polymers. 4,560,736, Cl. 526-312.000.

Pistor, Helmut H., to United States of America, Army. Etched multichannel electrical connector. 4,560,220, Cl. 339-74.00R.

Plamper, Gunter F.: *See—*
Lorello, Mark M.; and Plamper, Gunter F., 4,560,046, Cl. 192-11.000.

Plank, Vernon G.: *See—*
Berthel, Robert O.; Plank, Vernon G.; and LaGross, Dennis L., 4,561,018, Cl. 358-107.000.

Plasynski, Joseph E.: *See—*
Christenson, Roger M.; Valko, Joseph T.; Plasynski, Joseph E.; and Scriven, Roger L., 4,560,717, Cl. 523-456.000.

Plattner, Jacob J.: *See—*
Parks, James A.; and Plattner, Jacob J., 4,560,558, Cl. 514-379.000.

Pletsch, Hubert: *See—*
Wolf, Franz-Josef; and Pletsch, Hubert, 4,560,367, Cl. 464-83.000.

Plichta, Edward J.: *See—*
Salomon, Mark; and Plichta, Edward J., 4,560,630, Cl. 429-194.000.

Ploss, Hartmut, to Norddeutsche Affinerie AG. Pesticidal C_6–C_{25}-mercapto-organotin compounds. 4,560,702, Cl. 514-493.000.

Plumat, Robert; Robyn, Pierre; and Deschepper, Pierre, to Glaverbel. Apparatus for and method of spraying for forming refractories. 4,560,591, Cl. 427-422.000.

Plumley, Ralph M.; and Renaud, Henry H., Jr., to A&M Engineered Composites Corporation. Intrusion molding process for forming composite structures. 4,560,523, Cl. 264-102.000.

Plummer, Ilene: *See—*
Plummer, Raymond; and Plummer, Ilene, 4,559,830, Cl. 73-761.000.

Plummer, Mark A.: *See—*
Schroeder, Donald E., Jr.; Plummer, Mark A.; and Zimmerman, Carle C., Jr., 4,560,517, Cl. 260-505.00R.

Plummer, Raymond; and Plummer, Ilene. Testing device for fasteners. 4,559,830, Cl. 73-761.000.

Pneutek, Inc.: *See—*
Haytayan, Harry M., 4,560,061, Cl. 206-3.000.

Podosek, Edward, to Dennison National Company. Presentation folder. 4,560,299, Cl. 402-15.000.

Polak, Anthony J.; and Beuhler, Allyson J., to UOP Inc. Gas detection with novel electrolyte membrane and solid internal reference. 4,560,444, Cl. 204-1.00T.

Polaroid Corporation: *See—*
Johnson, Bruce K., 4,560,262, Cl. 354-180.000.

Polhemus, Carl E.: *See—*
McGowan, Gerald F.; Price, Gerald W.; Polhemus, Carl E.; and Ketchum, Ronald L., 4,560,873, Cl. 250-339.000.

Polyonics Corporation: *See—*
Hoover, Merwin F.; Reilly, Phillip B.; Salamone, Ann B.; and Vandebult, Jan, 4,560,445, Cl. 204-15.000.

Porta, Augusto; Schaub, Maurice; Ayerbe, Andre ; and Bunter, Guy, to Battelle Memorial Institute. Apparatus for sterilizing objects with an aqueous hypochlorite solution. 4,560,455, Cl. 204-130.000.

Possum Controls Limited: *See—*
Sommerhoff, Gerd W. C., 4,559,706, Cl. 33-23.00R.

Postle, Stephen R.: *See—*
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.

Poumakis, Demetrius, to United Technologies Corporation. Fail-passive driver circuit. 4,560,938, Cl. 328-71.000.

Powondra, Franz. Yieldable connection. 4,560,305, Cl. 405-259.000.

PPG Industries, Inc.: *See—*
Christenson, Roger M.; Valko, Joseph T.; Plasynski, Joseph E.; and Scriven, Roger L., 4,560,717, Cl. 523-456.000.

Precision Mecanique Labinal: *See—*
Chapelot, Raymond, 4,560,219, Cl. 339-60.00R.

Precision Metal Fabricators, Inc.: *See—*
Lenhart, Ronald A., 4,560,060, Cl. 198-803.500.

Prentice, John S.; and Cotreau, Gerald M., to Harris Corporation. Circuit for increasing voltage gain. 4,560,948, Cl. 330-282.000.

Pressaco, Pierre: *See—*
Carre, Jean-Jacques; and Pressaco, Pierre, 4,560,209, Cl. 303-22.00R.

Prestele, Karl, to Siemens Aktiengesellschaft. Method and device for flow measurement of small liquid volumes. 4,559,831, Cl. 73-861.050.

Prestige Group PLC, The: *See—*
Robinson, Geoffrey, 4,560,143, Cl. 251-338.000.

Prezas, Dimitrios P., to AT&T Bell Laboratories. Pitch detector for speech analysis. 4,561,102, Cl. 381-49.000.

Price, Edison A., to Edison Price, Incorporated. Display mounting device. 4,559,728, Cl. 40-124.200.

Price, Gerald W.: *See—*
McGowan, Gerald F.; Price, Gerald W.; Polhemus, Carl E.; and Ketchum, Ronald L., 4,560,873, Cl. 250-339.000.

Price, William F.; and Emery, Phillip L., to Penda Corporation. Air deflector for trailers. 4,560,195, Cl. 296-1.00S.

Prime Computer, Inc.: *See—*
Rodman, Paul K.; Ardini, Joseph L., Jr.; and Papworth, David B., 4,561,051, Cl. 364-200.000.

Procter & Gamble Company, The: *See—*
Bruno, David J., Jr.; Dodds, Michael J.; Fuqua, Debra L.; and Hunter, John E., 4,560,564, Cl. 426-250.000.
Curry, John D.; and Edwards, James B., 4,560,492, Cl. 252-110.000.

Prolic AG: *See—*
Bohme, Eike; and Rubenzer, Peter, 4,559,664, Cl. 15-302.000.

Pruckner, Walter, to Waltec, Inc. Stainless steel toilet. 4,559,650, Cl. 4-420.000.

Pryor, Timothy R. Controlled machining of combustion chambers, gears and other surfaces. 4,559,684, Cl. 29-156.40R.

PT Components, Inc.: *See—*
Min, Young K., 4,560,913, Cl. 318-760.000.

PTC Aerospace Inc.: *See—*
Brennan, Edward J., 4,560,859, Cl. 219-386.000.

Puchades, Jesus E. B.: *See—*
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., 4,560,545, Cl. 423-430.000.

Pudenz-Schulte Medical Research Corp.: *See—*
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, 4,560,375, Cl. 604-9.000.

Puech, Claude: *See—*
Papuchon, Michel; Arditty, Herve ; and Puech, Claude, 4,560,867, Cl. 250-225.000.

Purdue Research Foundation: *See—*
Friedlaender, Fritz J.; and Takayasu, Makoto, 4,560,484, Cl. 210-796.000.
Regnier, Frederick E.; and Gupta, Shri P., 4,560,704, Cl. 521-31.000.

Pusch, Gunter; Hoffmann, Alexander; and Aisslinger, Dieter E., to Pusch, Gunter. Winter camouflage material. 4,560,608, Cl. 428-196.000.

Pye (Electronic Products) Limited: *See—*
Wright, Basil M.; and Haire, Christopher A. R., 4,559,953, Cl. 128-680.000.

Pylon Company, Inc.: *See—*
Cooney, James S.; and Boyle, Stephen A., 4,560,223, Cl. 339-95.00R.

Quantic Industries, Inc.: *See—*
Marshall, William F., 4,559,875, Cl. 102-218.000.

Quartz et Silice: *See—*
Aldebert, Pierre, 4,560,247, Cl. 350-96.300.

Rachor, Lothar: *See—*
Hackstein, Karl; Hrovat, Milan; Schmidt-Hansberg, Thomas; Rachor, Lothar; and Huschka, Hans, 4,560,502, Cl. 252-628.000.

Radford, Kenneth C.; Keller, Herbert W.; Parks, Beryl H.; and Fuller, Robert R., to Westinghouse Electric Corp. Apparatus for coating nuclear fuel pellets with a burnable absorber. 4,560,462, Cl. 204-298.000.

Radford, Kenneth C.: *See—*
Eisenstatt, Larry R.; and Radford, Kenneth C., 4,560,575, Cl. 427-6.000.

Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., to Tektronix, Inc. Method and apparatus for accelerating the recording rate of a CRT graphic recorder. 4,560,989, Cl. 346-1.100.

Raduechel, Bernd: *See—*
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.

Raffelson, Harold: *See—*
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,560,674, Cl. 502-209.000.

Raguier, Marcel: *See—*
Gerard, Jean-Louis; Le Marchand, Claude; and Raguier, Marcel, 4,560,038, Cl. 188-73.380.

Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. [1,3]-Dioxolo[4,5-f]benzimidazoles and [1,4]-dioxino[2,3-f]benzimidazoles. 4,560,693, Cl. 514-338.000.

Ramamurti, Krishnamurti, to Tokyo Shibaura Denki Kabushiki Kaisha. Graticule sensor having a plurality of light detectors. 4,560,870, Cl. 250-237.00G.

Randall Wheel Trim, Inc.: *See*—
Ladouceur, Lawrence C., 4,559,689, Cl. 29-243.520.

Ranhagen, Ernst G. Method and grinder for the manufacture of pulp. 4,560,439, Cl. 162-261.000.

Ranson, Michele. Novel therapeutic composition useful particularly for healing wounds. 4,560,678, Cl. 514-44.000.

Rapp, Charles F.; Fausey, William H.; and Gonterman, J. Ronald, to Owens-Corning Fiberglas Corporation. Basalt compositions and their fibers. 4,560,606, Cl. 428-141.000.

Rathnam, Premila: *See*—
Saxena, Brij B.; and Rathnam, Premila, 4,560,649, Cl. 435-7.000.

Raubenheimer, Johann N., to Peacock Investments (Proprietary) Limited. Wheeled suction cleaners. 4,560,418, Cl. 134-18.000.

Rauser, Marita: *See*—
Rausing, Hans; and Rauser, Marita, 4,560,570, Cl. 426-564.000.

Rausing, Hans; and Rauser, Marita, to Tetra Pak Development SA. Method for the preparation of a porous, solid or semisolid food product based on ground fish or meat raw materials. 4,560,570, Cl. 426-564.000.

Rausing, Hans A., to Tetra Pak Developpement SA. Method for the preparation and packing of food products, in particular fish products, of long keeping quality. 4,560,567, Cl. 426-399.000.

Raveling, Hermann: *See*—
Smutek, Gerhard; and Raveling, Hermann, 4,560,796, Cl. 564-104.000.

Raychem Corporation: *See*—
Franckx, Joris R. I.; Mendes, Luiz N.; van Noten, Lodewijk; and Touchais, Thierry, 4,560,828, Cl. 174-71.00R.
Horsma, David A.; and Hammack, Teddy J., 4,560,498, Cl. 252-511.000.

Raymond, Roger S., to Delaware. Method for forming structural parts. 4,559,797, Cl. 72-63.000.

Raytheon Company: *See*—
Armstrong, Bruce G., 4,561,070, Cl. 365-227.000.

RCA Corporation: *See*—
Acampora, Alfonse, 4,561,012, Cl. 358-11.000.
Becke, Hans W., 4,561,008, Cl. 357-38.000.
Callen, Patrick J., 4,560,918, Cl. 323-273.000.
Clayton, Richard W., 4,560,129, Cl. 248-278.000.
Datta, Pabitra, 4,560,601, Cl. 428-64.000.
Deal, Samuel B.; and Bartch, Donald W., 4,560,581, Cl. 427-64.000.
Fox, Leonard P.; Datta, Pabitra; Matthies, Dennis L.; and Kawamoto, Hirohisa, 4,561,087, Cl. 369-276.000.
Garza, Richard G.; Sayegh, Pinhas; and Bjorklund, James R., 4,560,363, Cl. 446-342.000.
McNeely, Ronald K., 4,560,274, Cl. 356-154.000.
Sita, Richard K.; Orr, John R.; and Waring, John L., 4,561,027, Cl. 360-39.000.
Soltus, Michael; and Reese, James G., Jr., 4,559,762, Cl. 53-441.000.
Wu, Chung P.; and Kolondra, Frank, 4,560,879, Cl. 250-492.200.
Ziegel, Douglas H., 4,560,853, Cl. 219-121.0LD.

RCA Inc.: *See*—
Webb, Paul P., 4,561,007, Cl. 357-30.000.

Reading, Christopher: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,560,552, Cl. 424-114.000.

Rebhahn, Robert W. J.; and Cook, Wayne L., to Hilton-Davis Chemical Co., The. Ultrafiltration process for purification of dyes useful in foodstuffs. 4,560,746, Cl. 534-840.000.

Reed, Allan: *See*—
Goldberger, William M.; and Reed, Allan, 4,560,409, Cl. 75-130.00R.

Reed, Antony S.: *See*—
Papp, John E.; and Reed, Antony S., 4,560,212, Cl. 308-3.800.

Reed, Donald A.; and Lunk, Hans E. Foamed fluoropolymer articles having low loss at microwave frequencies and a process for their manufacture. 4,560,829, Cl. 174-102.00R.

Reese, James G., Jr.: *See*—
Soltus, Michael; and Reese, James G., Jr., 4,559,762, Cl. 53-441.000.

Regalbuto, John A.; and Christopher, Glenn B., to Jet Research Center, Inc. Mooring release apparatus and method. 4,559,890, Cl. 114-230.000.

Regen, Steven L., to Marquette University. Assembling multilayers of polymerizable surfactant on a surface of a solid material. 4,560,599, Cl. 428-36.000.

Regie Nationale des Usines Renault: *See*—
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, 4,560,885, Cl. 307-10.00R.

Regina Corporation: *See*—
Duncan, L. Scot; Groth, Hugh F.; and Basile, Peter A., 4,559,666, Cl. 15-353.000.
Fitzwater, Edwin, 4,559,665, Cl. 15-339.000.
Fitzwater, Edwin, 4,559,667, Cl. 15-415.00R.

Regnier, Frederick E.; and Gupta, Shri P., to Purdue Research Foundation. Polyamine based bonded phase chromatography. 4,560,704, Cl. 521-31.000.

Reid, Robert F.: *See*—
Cramp, John H. W.; Murray, Robert T.; Reid, Robert F.; and Mortier, Roy M., 4,560,248, Cl. 350-96.340.

Reilly, Phillip B.: *See*—
Hoover, Merwin F.; Reilly, Phillip B.; Salamone, Ann B.; and Vandebult, Jan, 4,560,445, Cl. 204-15.000.

Reimann, George J., to Mobil Oil Corporation. Thermoplastic bag pack. 4,560,067, Cl. 206-554.000.

Reinecke, Paul: *See*—
Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, 4,560,738, Cl. 528-62.000.

Reiner, Josef, to Oculus Optikgeraete GmbH. Enlarging and reading apparatus. 4,560,255, Cl. 350-503.000.

Reinmuth, Klaus: *See*—
Hunold, Klaus; Lipp, Alfred; and Reinmuth, Klaus, 4,560,668, Cl. 501-92.000.

Reishauer AG: *See*—
Wirz, Walter, 4,559,744, Cl. 51-287.000.

Reiter, Lawrence A., to Pfizer Inc. 2-(N-substituted guanidino)-4-hetero-arylthiazole antiulcer agents. 4,560,690, Cl. 514-256.000.

Renaud, Henry H., Jr.: *See*—
Plumley, Ralph M.; and Renaud, Henry H., Jr., 4,560,523, Cl. 264-102.000.

Renaud, Pierre, to Valeo. Clutch release device. 4,560,052, Cl. 192-98.000.

Renfro, Julian C.: *See*—
DeWoody, Robert O.; and Hollerich, Ralph M., 4,560,033, Cl. 188-2.00F.

Renger, Herman L.; Mann, Brian M.; and Meador, John. Cardiac tissue stimulator providing P-wave verification, telemetry, marker channels, and antitachycardia capabilities. 4,559,947, Cl. 128-419.0PG.

Renger, Larry H., to Mattel, Inc. Animated figure toy having a moveable torso and articulating jaw. 4,560,362, Cl. 446-340.000.

Repetto, Silvio, to S.p.A. Luigi Rizzi & C. Automatic cycle machine for the continuous fleshing of skins. 4,559,794, Cl. 69-43.000.

Republic Electronics, Inc.: *See*—
Kestenbaum, William W., 4,560,961, Cl. 332-23.00A.

Resco Products, Inc.: *See*—
Doby, Troy, 4,560,350, Cl. 432-241.000.

Research Corporation: *See*—
Papageorgiou, Vassilios P.; Bakola-Christianopoulou, Maria; and Tsipis, Constantinos A., 4,560,782, Cl. 556-137.000.

Research Products Corporation: *See*—
Riek, Jan C., 4,559,789, Cl. 62-157.000.

Respiratory Care, Inc.: *See*—
Cerny, David E., 4,560,519, Cl. 261-78.00A.

Ressel, Dennis E. Pre-formed building systems. 4,559,748, Cl. 52-90.000.

Rexnord Inc.: *See*—
Khilnani, Gul, 4,560,585, Cl. 427-103.000.
Szalanski, Scott E., 4,560,113, Cl. 241-275.000.

Reyes, Daniel W.: *See*—
Alves, Roger J.; and Reyes, Daniel W., 4,560,124, Cl. 248-27.100.

Reynolds, George O.: *See*—
Servaes, Donald A.; and Reynolds, George O., 4,560,235, Cl. 350-96.240.

Reynolds, Janie B.: *See*—
Reynolds, John F.; and Reynolds, Janie B., 4,560,097, Cl. 224-160.000.

Reynolds, John F.; and Reynolds, Janie B. Safety harness for motorcycle passenger. 4,560,097, Cl. 224-160.000.

Reynolds, John G.: *See*—
Yu, S. Gary; and Reynolds, John G., 4,560,465, Cl. 208-59.000.

Reynolds, Roger G., to Weldex, Inc. Spike welding system having improved power supply. 4,560,852, Cl. 219-113.000.

Rheinmetall GmbH: *See*—
Bocker, Jurgen; Klein, Klaus W.; and Gersbach, Klaus, 4,559,876, Cl. 102-520.000.

Rhone-Poulenc Fibres: *See*—
Baravian, Jean, 4,560,385, Cl. 8-115.700.

Rhone-Poulenc Sante: *See*—
Costantini, Michel; Igersheim, Francoise; and Krumenacker, Leon, 4,560,801, Cl. 568-362.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Soula, Gerard, 4,560,814, Cl. 570-144.000.

Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. 1,3-Bis-(1H-1,2,4-triazol-1-yl)-2-perfluoro-alkylpropan-2-ol antifungal agents. 4,560,697, Cl. 514-383.000.

Richo Company, Ltd.: *See*—
Sue, Takaji; and Sugie, Masatoshi, 4,560,990, Cl. 346-17.000.

Richter, Roland; Reinecke, Paul; Muller, Hanns P.; Bonse, Gerhard; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pest-combating agent having increased duration of action. 4,560,738, Cl. 528-62.000.

Richter, Roy: *See*—
Sell, Jeffrey A.; Capehart, Tenneille W.; and Richter, Roy, 4,560,042, Cl. 188-322.210.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for control of geometry of fragmented mass in an situ oil shale retort. 4,560,205, Cl. 299-2.000.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for explosiveiy expanding a pillar. 4,560,206, Cl. 299-2.000.

Ridder, Wouterus, to U.S. Philips Corporation. Broadcast receiver with automatic broadcast station storage. 4,561,112, Cl. 455-166.000.

Rieger, Georg: *See*—
Mannhart, Alto; and Rieger, Georg, 4,559,691, Cl. 29-283.500.

Riek, Jan C., to Research Products Corporation. Variable cycle moisturizing control circuit for a gas-liquid contact pad. 4,559,789, Cl. 62-157.000.

Rifi, Mahmoud R., to Union Carbide Corporation. Preparation of elastomeric, chlorosulfonated ethylene polymers. 4,560,731, Cl. 525-344.000.

Riley, William M., Jr., to Chicago Rawhide Mfg. Co. Contoured shaft seal for high pressure applications. 4,560,177, Cl. 277-134.000.

Rimmer, Michael J.; and Varga, John M. J. Movable flat for a carding engine and a support assembly therefor. 4,559,674, Cl. 19-102.000.

Ritchey, Stephen; and Kruse, Jerry L., to Cummins Engine Company, Inc. Turbocharger drain line with reinforced flexible conduit. 4,559,782, Cl. 60-605.000.

Ritchey, Stephen. to Cummins Engine Company, Inc. High swell gasket material. 4,560,718, Cl. 524-13.000.

Ritchey, Thomas W., to Lever Brothers Company. Method of relieving pain and inflammatory conditions employing substituted salicylamides. 4,560,549, Cl. 424-18.000.

Rite-Hite Corporation: *See*—
Hahn, Norbert, 4,560,315, Cl. 414-401.000.

Riverside Research Institute: *See*—
Lizzi, Frederic L.; Elbaum, Marek; and Feleppa, Ernest J., 4,561,019, Cl. 358-112.000.

Roberson, Carl: *See*—
Shepard, John K.; and Roberson, Carl, 4,560,080, Cl. 220-67.000.

Robert Bosch GmbH: *See*—
Ebert, Rolf; Knorreck, Peter; Kramer, Manfred; and Merkel, Wilfried, 4,559,816, Cl. 73-119.00A.
Flaig, Ulrich; Grieshaber, Hermann; Sieber, Albrecht; and Wietelmann, Jurgen, 4,559,914, Cl. 123-359.000.
Frey, Thomas; Grunwald, Werner; Knoll, Gunther; and Weyl, Helmut, 4,560,463, Cl. 204-424.000.
Leiber, Heinz, 4,559,777, Cl. 60-422.000.
Strohl, Willi; and Jauch, Gerhard, 4,559,968, Cl. 137-510.000.

Robinson, Geoffrey, to Prestige Group PLC, The. Pressure cooker relief valve assembly. 4,560,143, Cl. 251-338.000.

Robson, Harry E., to Exxon Research and Engineering Co. Method for the preparation of zeolites using a low water low alkali metal content gel. 4,560,542, Cl. 423-328.000.

Robyn, Pierre: *See*—
Plumat, Robert; Robyn, Pierre; and Deschepper, Pierre, 4,560,591, Cl. 427-422.000.

Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. 2-Piperazino-pteridines useful as antithrombotics and antimetastatics. 4,560,685, Cl. 514-222.000.

Rockefeller University, The: *See*—
Merrifield, Robert B., 4,560,676, Cl. 514-12.000.

Rockwell International Corporation: *See*—
Conner, William A., 4,561,111, Cl. 455-63.000.
Liggett, John V., 4,559,764, Cl. 53-557.000.
Sherrick, George O.; and Rosenthal, Joseph R., 4,560,428, Cl. 156-94.000.
Young, James P., 4,560,949, Cl. 330-284.000.

Rockwell-Rimoldi S.p.A.: *See*—
Lemke, Cornelis P., 4,559,883, Cl. 112-136.000.

Rodgers, Charles F.; and Rodgers, Herman R. Back hoe fork lifting device. 4,560,318, Cl. 414-724.000.

Rodgers, Herman R.: *See*—
Rodgers, Charles F.; and Rodgers, Herman R., 4,560,318, Cl. 414-724.000.

Rodman, Paul K.; Ardini, Joseph L., Jr.; and Papworth, David B., to Prime Computer, Inc. Memory access method and apparatus in multiple processor systems. 4,561,051, Cl. 364-200.000.

Roes, Christian: *See*—
Jung, Eggert; Roes, Christian; Wigger, Andreas; and Ziemen, Ernst-August, 4,561,016, Cl. 358-76.000.

Rogers, David J., to Crystaplex Plastics Ltd. Corrosive resistant grid construction for a suspended ceiling. 4,559,751, Cl. 52-665.000.

Rogers, Jerrold J.: *See*—
Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., 4,560,989, Cl. 346-1.100.

Rogers, William: *See*—
Taylor, Donald K.; Rogers, William; McGary, Vernon; and Lenart, Peter, 4,559,970, Cl. 137-557.000.

Rohrer, Rudolf, to Ciba-Geigy Corporation. Process for dyeing silk or fibre blends containing silk. 4,560,388, Cl. 8-543.000.

Rokos, George H. S.; and Wilson, James S., to Standard Telephones and Cables Public Limited Company. Temperature controlled crystal oscillator arrangement. 4,560,959, Cl. 331-176.000.

Rolls-Royce Motors Limited: *See*—
Fallows, Norman H., 4,559,845, Cl. 74-600.000.

Romagnoli, Andrea, to IMA Industria Macchine Automatiche SpA. Device for flexographic printing on a strip of packing material in packaging machines, particularly for blister packs. 4,559,755, Cl. 53-64.000.

Roos, Uwe V.: *See*—
Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., 4,560,340, Cl. 425-526.000.

Rosen, Howard N.; Kent, Albert C.; and Girod, George F., to United States of America, Agriculture. Device and method for measuring the energy content of hot and humid air streams. 4,559,823, Cl. 73-338.000.

Rosenberg, Jeffrey S.: *See*—
Haley, John E., Jr.; Lynch, Michael J.; and Rosenberg, Jeffrey S., 4,561,057, Cl. 364-436.000.

Rosenthal, Johannes: *See*—
Gehrmann, Klaus; Ohorodnik, Alexander; and Rosenthal, Johannes, 4,560,518, Cl. 260-970.000.

Rosenthal, Joseph R.: *See*—
Sherrick, George O.; and Rosenthal, Joseph R., 4,560,428, Cl. 156-94.000.

Ross, Donald L.: *See*—
Guimont, John M.; Manser, Gerald E.; and Ross, Donald L., 4,560,779, Cl. 549-510.000.

Rosskopf, Gerhard, to Intermedicat GmbH. Method for triggering an alarm in an infusion syringe. 4,560,979, Cl. 340-540.000.

Roth, Cary A.: *See*—
Kar, Nareshchandra J.; and Roth, Cary A., 4,560,175, Cl. 277-92.000.

Roth, Donald J., to Continental Packaging Company, Inc. Method of hot filling and closing a container. 4,560,566, Cl. 426-399.000.

Rottler, Wolfgang: *See*—
Bruggen, Gerhard; Karr, Dieter; and Rottler, Wolfgang, 4,561,064, Cl. 364-561.000.

Rouse, Donald W.; and Horwitz, Lawrence B., to Sangamo Weston, Inc. Correlation detectors for use in direct sequence spread spectrum signal receiver. 4,561,089, Cl. 370-18.000.

Rouse, Michael W.; and Thelen, Robert L., to Waste Recovery, Inc. Scrap shredding apparatus having cutter discs of different thickness. 4,560,112, Cl. 241-236.000.

Roxor Corporation: *See*—
Blom, C. James, 4,560,256, Cl. 350-613.000.

Rubenzer, Peter: *See*—
Bohme, Eike; and Rubenzer, Peter, 4,559,664, Cl. 15-302.000.

Rubinstein, Zvi. Sprinkler. 4,560,108, Cl. 239-222.170.

Rudman, Leonid I.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Runkel, Walter; Lenk, Erich; and Bauer, Karl, to Barmag Barmer Maschinenfabrik AG. Yarn heating chamber. 4,560,347, Cl. 432-59.000.

Russell, Carl D. Explosion-proof and fog-free day and night outside rear view mirror incorporating variable position actuator. 4,560,250, Cl. 350-279.000.

Rutledge, Raleigh N., to Cosden Technology, Inc. Apparatus for extruding thermoplastic compositions. 4,560,334, Cl. 425-4.00C.

Ryan, William E., to A. O. Smith Corporation. Method of making a molded fiber reinforced plastic leaf spring. 4,560,525, Cl. 264-136.000.

Rybeck, Torsten A. Blade and tool for its use in handling material, such as logs. 4,560,194, Cl. 294-61.000.

Ryczek, Lawrence J., to Eaton Corporation. ON/OFF delay circuit. 4,560,891, Cl. 307-597.000.

Ryczek, Lawrence J., to Eaton Corporation. One-shot delay timer. 4,560,892, Cl. 307-597.000.

Ryo, Eisaku: *See*—
Nakae, Taiji; and Ryo, Eisaku, 4,560,665, Cl. 436-172.000.

Ryono, Denis E.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Aminoalkyl and related substituted phosphinic acid angiotensin converting enzyme inhibitors. 4,560,680, Cl. 514-82.000.

Ryu, Ji-yong, to Exxon Research & Engineering Co. Process for synthesizing α,β-ethylenically unsaturated products using a multicomponent acidic catalyst composition. 4,560,790, Cl. 560-210.000.

S.R.M. Hydromekanik Aktiebolag: *See*—
Ahlen, Karl-Gustav; Bergstrom, Per-Olof; and Wallgren, Hans A., 4,559,849, Cl. 74-761.000.

Sabourin, Edward T.: *See*—
Bakshi, Kiran R.; D'Souza, Adrian; and Sabourin, Edward T., 4,560,800, Cl. 568-306.000.
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., 4,560,721, Cl. 524-378.000.

Sachot, Michel, to Centre d'Etudes du Fraisage. Machine tool with swiveling head. 4,559,682, Cl. 29-26.00A.

Sachs-Dolmar GmbH: *See*—
Morner, Bengt; Vollertsen, Otto; and Thomsen, Peter, 4,560,040, Cl. 188-77.00R.

Sacks, Jacob M.: *See*—
Coleman, Guy B.; Henderson, James W.; and Sacks, Jacob M., 4,560,974, Cl. 340-146.200.

Sadamori, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Method of fixing insertion electrode panel in compression-bonded semiconductor device. 4,559,697, Cl. 29-590.000.

Sado, Kenzo: *See*—
Doi, Yoshikazu; and Sado, Kenzo, 4,560,254, Cl. 350-427.000.

Safonov, Anatoly V.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov,

Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Sahara, Masayoshi: *See—*
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,560,267, Cl. 354-412.000.

Saini, Raj K.: *See—*
Hatton, John S.; Clarke, Roland N.; and Saini, Raj K., 4,561,038, Cl. 361-280.000.

Saint-Paul, Pierre: *See—*
Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, 4,559,993, Cl. 165-1.000.

Saito, Mitugu: *See—*
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Saito, Yu; and Harada, Tsuneo, to Kawasaki Jukogyo Kabushiki Kaisha; and Daiwa Alloy Mfg. Co. Alkali-proof cast aluminum product having a wear-resistant surface layer. 4,560,615, Cl. 428-328.000.

Sakai, Kazushige: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Sakai, Takayoshi: *See—*
Iguchi, Hideaki; Sakai, Takayoshi; and Ohashi, Hajime, 4,561,050, Cl. 364-167.000.

Sakai, Takeshi: *See—*
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,560,764, Cl. 548-190.000.

Sakakibara, Naoji; Amano, Hiroyuki; Morioka, Hiroaki; and Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Actuator. 4,559,864, Cl. 91-454.000.

Sakakibara, Shiro, to Aisin-Warner, Ltd. Stepless automatic transmission for motor vehicles. 4,559,850, Cl. 74-868.000.

Sakakibara, Yasushi: *See—*
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, 4,561,096, Cl. 372-46.000.

Sakamoto, Hideshi: *See—*
Fujishita, Kusuo; and Sakamoto, Hideshi, 4,560,734, Cl. 526-142.000.

Sakamoto, Kenshi: *See—*
Narimatsu, Hiroki; Sakamoto, Kenshi; Edayoshi, Tomoko; and Kubota, Hayato, 4,560,560, Cl. 426-38.000.

Sakamoto, Takashi; Sano, Tetsuo; Kodama, Eiji; and Choh, Masamichi, to Dainippon Screen Mfg. Co., Ltd. Method of tracing/recording image lines and apparatus therefor. 4,561,061, Cl. 364-550.000.

Sakane, Kazuo: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,560,765, Cl. 548-194.000.

Sakane, Toshio: *See—*
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, 4,560,864, Cl. 250-201.000.

Sakaue, Yoshinori: *See—*
Fujiwara, Mitsugu; Sakaue, Yoshinori; Aso, Tomio; Kurokawa, Koshiro; and Obara, Hideo, 4,560,295, Cl. 400-637.100.

Sakoguchi, Etsuo: *See—*
Tsukamoto, Kazuyoshi; and Sakoguchi, Etsuo, 4,560,851, Cl. 219-10.770.

Sakurada, Nobuaki: *See—*
Sato, Yuichi; Sakurada, Nobuaki; Kawamura, Hideaki; and Watanabe, Yoshitaka, 4,560,997, Cl. 346-140.00R.

Sakurai, Masaki: *See—*
Abe, Ryozo; and Sakurai, Masaki, 4,561,026, Cl. 358-336.000.

Sakurai, Masaru: *See—*
Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, 4,560,087, Cl. 221-73.000.

Salamone, Ann B.: *See—*
Hoover, Merwin F.; Reilly, Phillip B.; Salamone, Ann B.; and Vandebult, Jan, 4,560,445, Cl. 204-15.000.

Salomon, Mark; and Plichta, Edward J., to United States of America, Army. Rechargeable lithium cell having an electrolyte comprising 4-butyrolactone in dimethoxyethane. 4,560,630, Cl. 429-194.000.

Salort, Guy J. External apparatus for motor handicaps of at least one upper limb. 4,559,932, Cl. 128-77.000.

Samejima, Shuuichi: *See—*
Atsugi, Takeo; Samejima, Shuuichi; and Masamura, Tatsurou, 4,561,099, Cl. 375-97.000.

Sammells, Anthony F.: *See—*
Morduchowitz, Abraham; and Sammells, Anthony F., 4,560,450, Cl. 204-75.000.

Samuelsson, Bengt; Serhan, Charles; and Hamberg, Mats. Inflammatory lipoxin A and anti-anflammatory lipoxin B compounds. 4,560,514, Cl. 260-410.000.

Sanbo Chemical Industries Co., Ltd.: *See—*
Ichihashi, Taichi; Kawai, Wasaburo; Naraoka, Tadashi; and Asano, Takateru, 4,560,640, Cl. 430-280.000.

Sanders, James M.: *See—*
Hall, John B.; Sanders, James M.; and Siano, James N., 4,560,499, Cl. 252-522.00R.

Sanderson, George F., to James Howden & Company Limited. Lubricant reservoir. 4,560,331, Cl. 418-65.000.

Sandoz Ltd.: *See—*
Hopkins, Tony A.; and Seitz, Rudolf, 4,560,386, Cl. 8-437.000.

Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., to Eltech Systems Corporation. Aluminum wettable materials for aluminum production. 4,560,448, Cl. 204-67.000.

Sanezawa, Fumio: *See—*
Nagumo, Shinichi; Hase, Yoshifumi; and Sanezawa, Fumio, 4,560,104, Cl. 236-34.500.

Sangamo Weston, Inc.: *See—*
Rouse, Donald W.; and Horwitz, Lawrence B., 4,561,089, Cl. 370-18.000.

Sanneman, Richard W.: *See—*
Dochow, Claude; Patterson, Mark L.; and Sanneman, Richard W., 4,560,987, Cl. 343-17.700.

Sano, Fumiaki: *See—*
Hirahara, Takuho; Sano, Fumiaki; Ishijima, Koji; Kawaguchi, Susumu; and Nakane, Kazuhiro, 4,560,329, Cl. 418-47.000.

Sano, Tetsuo: *See—*
Sakamoto, Takashi; Sano, Tetsuo; Kodama, Eiji; and Choh, Masamichi, 4,561,061, Cl. 364-550.000.

Sano, Yasuro, to Janome Sewing Machine Co., Ltd. Switching mechanism of control amount in electronic control sewing machine. 4,559,887, Cl. 112-455.000.

Santa Barbara Research Center: *See—*
Cinzori, Robert J.; and Kern, Mark T., 4,560,874, Cl. 250-339.000.

Santrade Limited: *See—*
Wilhelmsson, Per H., 4,560,408, Cl. 75-128.00A.

Sanwa Kagaku Kenkyusho Co. Ltd.: *See—*
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, 4,560,679, Cl. 514-63.000.

Sanyo Electric Co., Ltd.: *See—*
Asao, Motoaki; and Nanko, Hideaki, 4,561,100, Cl. 375-99.000.
Tsukamoto, Kazuyoshi; and Sakoguchi, Etsuo, 4,560,851, Cl. 219-10.770.

Saotome, Masaru: *See—*
Murakami, Takuya; and Saotome, Masaru, 4,560,027, Cl. 180-312.000.

Sapper, Richard, to Pamont AG. Recliner chair. 4,560,199, Cl. 297-323.000.

Sarver, Patricia I. Vehicular windshield curtain for inhibiting heat transfer. 4,560,245, Cl. 296-95.00C.

Sasaki, Hiromu: *See—*
Hayashi, Motohiko; Karita, Toshiaki; Kotani, Matahira; and Sasaki, Hiromu, 4,560,992, Cl. 346-76.0PH.

Sasaki, Makoto, to Minnesota Mining and Manufacturing Company. Process of making low-profile transfer article. 4,560,587, Cl. 427-152.000.

Sasaki, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha. Lifting apparatus. 4,559,840, Cl. 74-89.210.

Sasaki, Yasuharu: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,560,755, Cl. 544-363.000.

Sasakura, Kazuyuki: *See—*
Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, 4,560,684, Cl. 514-221.000.

Sasayama, Takao: *See—*
Hirayama, Takeshi; Amano, Matsuo; Sasayama, Takao; and Baba, Shirou, 4,561,056, Cl. 364-431.050.

Satake, Mitsuo; and Toyota, Shigekata, to Hitachi, Ltd.; and Hitachi Video Engineering. Disk loading and unloading system. 4,561,084, Cl. 369-75.200.

Sato, Humiyuki: *See—*
Ikegaki, Makoto; Nakanishi, Masayuki; Sato, Humiyuki; and Hashimoto, Tokuo, 4,560,900, Cl. 313-479.000.

Sato, Jinichi; Kurusu, Toshiro; Kondo, Naoyoshi; and Tamaki, Makoto, to Sato Shokuhin Kogyo Kabushiki Kaisha. Process for the preparation of instant coffee or the like. 4,560,571, Cl. 426-594.000.

Sato, Kanemasa; and Ueno, Sadayasu, to Hitachi, Ltd. Thermal air flow meter. 4,559,814, Cl. 73-118.000.

Sato, Katsuaki: *See—*
Arai, Sakuji; Sato, Katsuaki; Kochi, Susumu; and Hishida, Hiroaki, 4,559,776, Cl. 60-280.000.

Sato, Kozo; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Base precursor for heat-developable photosensitive material. 4,560,763, Cl. 546-341.000.

Sato, Kozo: *See—*
Naito, Hideki; and Sato, Kozo, 4,560,644, Cl. 430-351.000.

Sato, Shigeyuki; and Matsushita, Mitsumasa, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Rust preventing epoxy resin compositions. 4,560,716, Cl. 523-451.000.

Sato Shokuhin Kogyo Kabushiki Kaisha: *See—*
Sato, Jinichi; Kurusu, Toshiro; Kondo, Naoyoshi; and Tamaki, Makoto, 4,560,571, Cl. 426-594.000.

Sato, Susumu: *See—*
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, 4,560,785, Cl. 560-52.000.

Sato, Syohei: *See—*
Takagi, Shigehide; Yokota, Norio; Sato, Syohei; and Nishi, Toshihiro, 4,560,413, Cl. 106-120.000.

Sato, Takeshi, to Nankaisangyo Co. Ltd.; and Toyamasanki Co. Ltd. Method and apparatus for producing bouffant caps. 4,560,434, Cl. 156-474.000.

Sato, Tetsuya: *See—*
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.

Sato, Yo; Kashiwaba, Tadao; Sakurai, Masaru; Matsuda, Yasuhiko; and Kondo, Koichi, to Kabushiki Kaisha Sato. Label peeling device for label issuing machine. 4,560,087, Cl. 221-73.000.
Sato, Yuichi; Sakurada, Nobuaki; Kawamura, Hideaki; and Watanabe, Yoshitaka, to Canon Kabushiki Kaisha. Method and apparatus for forming a pattern. 4,560,997, Cl. 346-140.00R.
Satoh, Yoshio; Yanase, Takeyasu; and Komenou, Kazunari, to Fujitsu Limited. Magnetic bubble memory device gates. 4,561,069, Cl. 365-36.000.
Satzler, Ronald L., to Caterpillar Tractor Co. Wheel tandem drive mechanism. 4,560,018, Cl. 180-9.100.
Sauer, Kenneth; and Fogo, Richard. Worm baiting tool. 4,559,734, Cl. 43-4.000.
Sauer, Wolfgang, to ITT Industries, Inc. Monolithic integrated transistor HF crystal oscillator circuit. 4,560,955, Cl. 331-116.00R.
Savage, James A.: *See*—
Lewis, Keith L.; and Savage, James A., 4,560,576, Cl. 427-38.000.
Savini, Charles: *See*—
Yeh, Chuen Y.; and Savini, Charles, 4,560,803, Cl. 568-401.000.
Yeh, Chuen Y.; and Savini, Charles, 4,560,804, Cl. 568-408.000.
Yeh, Chuen Y.; and Savini, Charles, 4,560,805, Cl. 568-408.000.
Sawyer, David A.: *See*—
Baxter, Martin G.; Elphick, Albert R.; Miller, Alistair A.; and Sawyer, David A., 4,560,687, Cl. 514-242.000.
Saxena, Brij B.; and Rathnam, Premila, to Cornell Research Foundation. Assaying for hLH or hCG with immobilized hormone receptors. 4,560,649, Cl. 435-7.000.
Sayegh, Pinhas: *See*—
Garza, Richard G.; Sayegh, Pinhas; and Bjorklund, James R., 4,560,363, Cl. 446-342.000.
Schachter, Friedrich. Liquid gas-operated lighter. 4,560,345, Cl. 431-344.000.
Scharf, Rolf; Koch, Ferdinand; and Schlussler, Hans-Joachim, to Henkel Kommanditgesellschaft auf Aktien. Liquid residue reducing preparations containing octane-1-phosphonic acid or a water-soluble salt thereof. 4,560,493, Cl. 252-174.160.
Schaub, Maurice: *See*—
Porta, Augusto; Schaub, Maurice; Ayerbe, Andre ; and Bunter, Guy, 4,560,455, Cl. 204-130.000.
Schering Aktiengesellschaft: *See*—
Blasing, Horst; and Kallweit, Manfred, 4,560,460, Cl. 204-224.00R.
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.
Schering Corporation: *See*—
Villani, Frank J., 4,560,688, Cl. 514-243.000.
Schertler, Siegfried: *See*—
Bosch, Hubert, 4,560,141, Cl. 251-167.000.
Scheurer, Roger J.: *See*—
Peterson, Richard L.; Johnson, James A.; Scheurer, Roger J.; and Steinberg, Richard W., 4,560,011, Cl. 172-194.000.
Schieck, Richard A., to Xerox Corporation. Plural mode copy sheet output slitter. 4,559,855, Cl. 83-425.300.
Schijven, Lucas W. M., to U.S. Philips Corporation. Cassette recorder with low-energy pause control. 4,561,030, Cl. 360-93.000.
Schimko, Reinhold; and Paul, Werner, to Universal Maschnenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Flat knitting machine with selective needle selection. 4,559,791, Cl. 66-75.100.
Schlanger, Albert: *See*—
Wilson, Wilfred W.; and Schlanger, Albert, 4,560,192, Cl. 292-339.000.
Schlumberger Technology Corporation: *See*—
Beseme, Jean H.; Corral, Jose R.; and Glotin, Bernard J., 4,559,709, Cl. 33-178.00F.
Perl, Julius, 4,560,830, Cl. 178-19.000.
Upchurch, James M., 4,560,000, Cl. 166-55.100.
Schlussler, Hans-Joachim: *See*—
Scharf, Rolf; Koch, Ferdinand; and Schlussler, Hans-Joachim, 4,560,493, Cl. 252-174.160.
Schmidt-Hansberg, Thomas: *See*—
Hackstein, Karl; Hrovat, Milan; Schmidt-Hansberg, Thomas; Rachor, Lothar; and Huschka, Hans, 4,560,502, Cl. 252-628.000.
Schmidts, Kurt; Feyh, Hans-Otto; and Mania, Max J., to BASF Aktiengesellschaft. Reel for tape-like material, especially magnetic tape. 4,560,114, Cl. 242-71.800.
Schmitt, Hans-Georg: *See*—
Oeckl, Siegfried; Schmitt, Hans-Georg; and Brandes, Wilhelm, 4,560,694, Cl. 514-359.000.
Schnadig Corporation: *See*—
Webb, Kenneth L., Jr., 4,559,683, Cl. 29-91.100.
Schneider, Georg: *See*—
Kutzner, Willi A. P.; Schneider, Georg; and Kubert, Thomas, 4,559,871, Cl. 101-207.000.
Schneider, Hansjorg: *See*—
Bruttel, Beat; Schneider, Hansjorg; and Dorfel, Werner H., 4,560,747, Cl. 534-887.000.
Schneider, Heinz: *See*—
Deppe, Gerd-Joachim; Ettwig, Hans H.; Schneider, Heinz; and Hof, Wolfram, 4,559,819, Cl. 73-159.000.
Schneider, John C., to Northern Telecom Limited. Standby power supply. 4,560,887, Cl. 307-66.000.
Schneider, Marvin L.: *See*—
Windish, Willis E.; and Schneider, Marvin L., 4,560,034, Cl. 188-72.300.
Schnell, Albert C.: *See*—
Daniels, Ben G.; Hall, Nicholas E.; Naples, Daniel F.; and Schnell, Albert C., 4,559,760, Cl. 53-314.000.
Schnettler, Richard A.; Dage, Richard C.; and Grisar, J. Martin, to Merrell Dow Pharmaceuticals Inc. Pyrrole-3-carboxylate cardiotonic agents. 4,560,700, Cl. 514-423.000.
Schniggenfittig, Gunther: *See*—
Schuhmann, Siegfried; and Schniggenfittig, Gunther, 4,559,874, Cl. 101-350.000.
Scholl, Frederick W., to Codenoll Technology Corporation. Method and apparatus for detecting the collision of data packets. 4,560,984, Cl. 340-825.500.
Scholl, Frederick W.; and Coden, Michael H., to Codenoll Technology Corporation. Data receiver. 4,561,091, Cl. 370-85.000.
Schora, Frank C.; Janka, John C.; and Feldkirchner, Harlan L., to Institute of Gas Technology. Production of hydrogen from oil shale. 4,560,547, Cl. 423-650.000.
Schottler, Peter: *See*—
Wucherpfennig, Karl; Bott, Ernst W.; and Schottler, Peter, 4,560,565, Cl. 426-330.400.
Schrader, Glenn L.: *See*—
McCarty, Kevin F.; and Schrader, Glenn L., 4,560,470, Cl. 208-215.000.
Schroeder, Donald E., Jr.; Plummer, Mark A.; and Zimmerman, Carle C., Jr., to Marathon Oil Company. Sulfonation of crude oils with gaseous SO_3 to produce petroleum sulfonates. 4,560,517, Cl. 260-505.00R.
Schroeder, John E. Marshmallow sheet and packaging arrangement. 4,560,562, Cl. 426-87.000.
Schuck, Thomas W., to Air Products and Chemicals, Inc. High pressure helium pump for liquid or supercritical gas. 4,559,786, Cl. 62-55.000.
Schuhmann, Siegfried; and Schniggenfittig, Gunther, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink metering system in letterpress and offset printing machines. 4,559,874, Cl. 101-350.000.
Schulte, Rudolf R.; East, Gary P.; Bryant, Marga M.; and Heindl, Alfons, to Pudenz-Schulte Medical Research Corp. Flow control valve. 4,560,375, Cl. 604-9.000.
Schulte, Willi; and Heimke, Gunther, to Friedrichsfeld GmbH - Steinzeug- und Kunststoffwerke. Tooth implant. 4,560,353, Cl. 433-173.000.
Schulz, Donald N.; Peiffer, Dennis G.; Kowalik, Ralph M.; and Kaladas, Jeffrey J., to Exxon Research and Engineering Co. Drag reduction agent. 4,560,710, Cl. 523-175.000.
Schulz, Eckhard, to Sicowa Verfahrenstechnik fuer Baustoffe GmbH & Co. KG. Method for hardening form substances of building materials containing binding agents and autoclave for the execution of the method. 4,560,346, Cl. 432-24.000.
Schulz, Joachim; and Thelen, Werner, to AURORA Konrad G. Schulz GmbH & Co. Apparatus for heating and ventilating. 4,560,103, Cl. 236-13.000.
Schurger, Rainer: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Schutrum, Walter L., to Eastman Kodak Company. Electroformed charge electrode structure for ink jet printers. 4,560,991, Cl. 346-75.000.
Schwab, Manfred F., to Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co. Blind rivet setting tool. 4,559,806, Cl. 72-391.000.
Schwartz, Wesley W., to Square D Company. Track bolt fastener. 4,560,130, Cl. 248-297.200.
Schwartz, William A.: *See*—
Spence, David C.; and Schwartz, William A., 4,560,824, Cl. 585-662.000.
Schwartzbach, Christian: *See*—
Caspersen, Leif D.; Felsvang, Karsten S.; and Schwartzbach, Christian, 4,560,543, Cl. 423-242.000.
Schwarz, Norbert: *See*—
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.
Schwarzmeier, Karl: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,560,336, Cl. 425-78.000.
Scire, Fredric E.; and Teague, E. Clayton, to United States of America, Commerce. Flexure hinge. 4,559,717, Cl. 33-568.000.
Scott Paper Company: *See*—
Freeman, Eben W., 4,560,578, Cl. 427-44.000.
Scott, Samuel C. Headrest for sedentary traveler. 4,560,201, Cl. 297-393.000.
Scotti, Carlo: *See*—
Vanni, Sergio; Guidi, Loris; Vallini, Paolo; Pace, Renato C.; and Scotti, Carlo, 4,560,384, Cl. 8-94.210.
Scourtelis, Nicolas. Room divider. 4,559,750, Cl. 52-238.100.
Scriven, Roger L.: *See*—
Christenson, Roger M.; Valko, Joseph T.; Plasynski, Joseph E.; and Scriven, Roger L., 4,560,717, Cl. 523-456.000.
SDS-Relais AG: *See*—
Nagamoto, Mitsuki; and Hashiya, Ikuo, 4,560,966, Cl. 335-80.000.
Sealey, Francis; and Weiland, Richard H., to Boeing Company, The. Door locking mechanism. 4,560,123, Cl. 244-129.500.
Segawa, Hirohisa; Kitani, Motoe; Shimizu, Takao; and Mizuno, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Consumable electrode type arc welding apparatus having a selectable start current. 4,560,857, Cl. 219-130.210.

Seidl, Josef, to Bayerische Motoren Werke AG. Rider ejector arrangement for a single track vehicle, such as a motorcycle. 4,560,185, Cl. 280-748.000.

Seitz, Rudolf: *See*—
Hopkins, Tony A.; and Seitz, Rudolf, 4,560,386, Cl. 8-437.000.

Seki, Hirokazu: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,560,764, Cl. 548-190.000.

Seki, Kimiaki, to Mitsubishi Denki Kabushiki Kaisha. Diaphragm type pump device. 4,560,326, Cl. 417-480.000.

Sekiguchi, Kazuya: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,559,963, Cl. 137-1.000.

Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Liquid crystal device with anti-reflection function in electrode. 4,560,240, Cl. 350-336.000.

Sekizawa, Hidekazu: *See*—
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,560,280, Cl. 356-375.000.

Selick, Barbara: *See*—
Nusbaum, Arthur, 4,559,749, Cl. 52-221.000.

Sell, Jeffrey A.; Capehart, Tenneille W.; and Richter, Roy, to General Motors Corporation. Method of self-pressurizing a damper. 4,560,042, Cl. 188-322.210.

Selwitz, Charles M.: *See*—
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., 4,560,721, Cl. 524-378.000.

Semba, Katsumi: *See*—
Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, 4,560,198, Cl. 296-185.000.

Senneron, Michel: *See*—
Denis, Jacques; Senneron, Michel; and Sillion, Bernard, 4,560,490, Cl. 252-51.50A.

Sergeev, Jury N.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Serhan, Charles: *See*—
Samuelsson, Bengt; Serhan, Charles; and Hamberg, Mats, 4,560,514, Cl. 260-410.000.

Servaes, Donald A.; and Reynolds, George O., to Honeywell Inc. Fiber optic condenser for an optical imaging system. 4,560,235, Cl. 350-96.240.

Servas, Frank; Lewin, John E.; Pavlov, Tudor; and Diettrich, Lambert J., Jr., to Shiley, Inc. Heat exchanger for extracorporeal circuit. 4,559,999, Cl. 165-156.000.

Servocavi S.p.A.: *See*—
Margaroli, Giovanni; and Gandini, Mario, 4,560,225, Cl. 339-97.00C.

Setescak, Linda L.: *See*—
Martin, Lawrence L.; and Setescak, Linda L., 4,560,701, Cl. 514-443.000.

Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,560,416, Cl. 127-33.000.

Seybold, Guenther, to BASF Aktiengesellschaft. Preparation of N,N-disubstituted 2-aminothiazoles. 4,560,751, Cl. 544-60.000.

Seyerle, Carl E., to Outboard Marine Corporation. Cutter blade for pneumatically transporting grass clippings. 4,559,769, Cl. 56-295.000.

Shahar, Gabriel: *See*—
Larom, Dov; and Shahar, Gabriel, 4,559,912, Cl. 123-350.000.

Shalaby, Shalaby W.: *See*—
Koelmel, Donald; and Shalaby, Shalaby W., 4,559,945, Cl. 128-335.500.

Shannon, John M., to U.S. Philips Corporation. Solid-state infrared radiation imaging devices having a radiation-sensitive portion with a superlattice structure. 4,561,005, Cl. 357-24.000.

Shannon, Michael A.: *See*—
Walling, Jorg-Hein; Arbuthnot, Gerald; and Shannon, Michael A., 4,560,521, Cl. 264-24.000.

Sharp Kabushiki Kaisha: *See*—
Arai, Nobushige, 4,560,620, Cl. 428-565.000.
Hayashi, Motohiko; Karita, Toshiaki; Kotani, Matahira; and Sasaki, Hiromu, 4,560,992, Cl. 346-76.0PH.

Sharpe, Robin, to U.S. Philips Corporation. Analog RC active filter. 4,560,963, Cl. 333-172.000.

Sharpless, Karl B.; and Johnson, Roy A., to Massachusetts Institute of Technology. Metal-mediated halohydrin formation. 4,560,811, Cl. 568-848.000.

Shaver, Michael O., to BDM Corporation, The. Method and apparatus for data communications over local area and small area networks. 4,561,092, Cl. 370-89.000.

Shaw, Herbert J.; Bergh, Ralph A.; and Digonnet, Michel J. F., to Leland Stanford Junior University, Board of Trustees of the. Fiber optic switchable coupler. 4,560,234, Cl. 350-96.150.

Shaw, Wilfrid G., to Standard Oil Company, The. Catalyst for the oxidation of unsaturated aldehydes. 4,560,673, Cl. 502-206.000.

Sheldon, Jerome F., to Jerome F. Sheldon Inc. Carton stabilizer. 4,560,065, Cl. 206-427.000.

Shell Oil Company: *See*—
Blytas, George C., 4,560,812, Cl. 568-869.000.
Crossan, J. Robert, 4,560,727, Cl. 525-95.000.
Devlin, Barry R. J., 4,560,401, Cl. 71-88.000.
Drozd, Jan W.; and Bailey, Maureen L., 4,560,657, Cl. 435-123.000.
Orr, Alexander F., 4,560,507, Cl. 260-239.00A.
Stoutamire, Donald W.; and Tieman, Charles H., 4,560,515, Cl. 260-465.00D.

Shepard, John K.; and Roberson, Carl, to Continental Group, Inc., The. Reinforced structure for steel ends of cylindrical shipping containers. 4,560,080, Cl. 220-67.000.

Sheridan, Douglas: *See*—
Hamy, Norbert; Nutt, Phillip; and Sheridan, Douglas, 4,559,723, Cl. 36-102.000.

Sherman, Guy J., to Sherman Laboratories, Inc. Soft contact lens wetting solution and in-eye comfort solution containing preservative and method. 4,560,491, Cl. 252-106.000.

Sherman Laboratories, Inc.: *See*—
Sherman, Guy J., 4,560,491, Cl. 252-106.000.

Sherman, William E., II; and Behrmann, Edgar A., to Allied Corporation. Single pin universal joint. 4,560,368, Cl. 464-112.000.

Sherrard, Perry O.: *See*—
Bloom, Phyllis R.; and Sherrard, Perry O., 4,559,903, Cl. 119-19.000.

Sherrick, George O.; and Rosenthal, Joseph R., to Rockwell International Corporation. System and method for producing cured composites. 4,560,428, Cl. 156-94.000.

Sherwin, Martin B.; and Blouin, John J., to W. R. Grace & Co. Process for preparing L-aspartic acid. 4,560,653, Cl. 435-109.000.

Sherwin-Williams Company, The: *See*—
Druetzler, Thomas W., 4,560,494, Cl. 252-182.000.

Shew, Jerry D., to Stewart-Warner Corporation. Lever operated lubricator. 4,560,095, Cl. 222-256.000.

Shibai, Hiroshiro: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.

Shibata, Hiroshi: *See*—
Kohara, Masanobu; Nakao, Shin; and Shibata, Hiroshi, 4,561,011, Cl. 356-81.000.

Shigeru, Iwakoshi: *See*—
Teruyuki, Ohba; Kazuo, Arai; Atushi, Yahagi; and Shigeru, Iwakoshi, 4,560,109, Cl. 239-583.000.

Shiio, Tsuyoshi: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, 4,560,748, Cl. 536-24.000.

Shiley, Inc.: *See*—
Servas, Frank; Lewin, John E.; Pavlov, Tudor; and Diettrich, Lambert J., Jr., 4,559,999, Cl. 165-156.000.

Shimada, Shigeru: *See*—
Nishimatsu, Masaharu; Kubota, Yuichi; Tamazaki, Kazunori; and Shimada, Shigeru, 4,560,617, Cl. 428-423.100.

Shimase, Akira: *See*—
Tamura, Hifumi; Okano, Hiroshi; Ishitani, Tohru; and Shimase, Akira, 4,560,907, Cl. 315-111.010.

Shimizu, Goro; and Kitagawa, Yosuke, to Matsui Shikiso Chemical Co., Ltd. Method of flocking treatment. 4,560,604, Cl. 428-87.000.

Shimizu, Iwao: *See*—
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.

Shimizu, Senzo: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.

Shimizu, Takao: *See*—
Segawa, Hirohisa; Kitani, Motoe; Shimizu, Takao; and Mizuno, Masanori, 4,560,857, Cl. 219-130.210.

Shimizu, Tokuzo. Reel supporting structure in open reel type tape cassette. 4,560,117, Cl. 242-199.000.

Shimomura, Takeshi: *See*—
Aoyagi, Juuro; Ichikawa, Toshiji; Koide, Mikio; and Shimomura, Takeshi, 4,560,720, Cl. 524-288.000.

Shimoyama, Yoshiaki; Miyoshi, Kunisuke; and Hiromae, Yoshitaka, to Nippon Steel Corporation. Process for producing a non-oriented electromagnetic steel sheet having excellent magnetic properties. 4,560,423, Cl. 148-111.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,560,589, Cl. 427-249.000.
Mori, Shigeru; and Tarumi, Yasuo, 4,560,784, Cl. 556-401.000.
Nakamura, Tsutomu; and Itoh, Kunio, 4,560,719, Cl. 524-269.000.
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, 4,560,679, Cl. 514-63.000.
Ueno, Susumu; and Nomura, Hirokazu, 4,560,458, Cl. 204-165.000.

Shin Nisso Kako Co., Ltd.: *See*—
Okumura, Masatoshi, 4,560,526, Cl. 264-328.200.

Shindo, Toshiki: *See*—
Hayashi, Takehiko; Ikuta, Hiroyuki; and Shindo, Toshiki, 4,559,798, Cl. 72-81.000.

Shinozaki, Toshiaki; and Mori, Ichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Fixed-slit type photoelectric microscope. 4,560,278, Cl. 356-364.000.

Shionogi & Co., Ltd.: *See*—
Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, 4,560,684, Cl. 514-221.000.
Totani, Tetsushi; Aono, Katsutoshi; and Komura, Michihiro, 4,560,781, Cl. 556-137.000.

Shioyama, Tod K.; and Little, Robert A., to Phillips Petroleum Company. Process for producing aluminum citrate solutions. 4,560,783, Cl. 556-183.000.
Shiraga, Yusei: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.
Shirai, Kazuo, to Elco International K.K. Electrical connector. 4,560,231, Cl. 339-258.0RR.
Shirai, Tomoyuki: *See*—
Fukui, Tsutomu; and Shirai, Tomoyuki, 4,561,013, Cl. 358-22.000.
Shirako, Hideo, to Olympus Optical Co., Ltd. Pad apparatus for magnetic tape cassette. 4,561,033, Cl. 360-130.330.
Shirakura, Masaru: *See*—
Honda, Shoich; Muto, Osamu; and Shirakura, Masaru, 4,559,909, Cl. 123-90.280.
Shiratani, Yusuke: *See*—
Miyawaki, Yoshiharu; Hanmyo, Masayuki; Shiratani, Yusuke; Matsuda, Yasuhiro; Komatsu, Yoshimi; Kondo, Tsuneo; and Usui, Tsutomu, 4,560,405, Cl. 75-12.000.
Shiseido Company Ltd.: *See*—
Kubo, Sanae; and Kawada, Emiko, 4,560,554, Cl. 424-71.000.
Shklyarman, Sergei S.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.
Shoko Kiko Co., Ltd.: *See*—
Takami, Masaho, 4,559,767, Cl. 53-589.000.
Shono, Tatsuya, to Otsuka Kagaku Kabushiki Kaisha. Electrolytic process for preparation of α-alkylated acetic acid derivatives. 4,560,447, Cl. 204-59.00R.
Shoop, James D.: *See*—
Lankard, David R.; and Shoop, James D., 4,559,881, Cl. 109-83.000.
Shorter, Myron L., Jr. Pontoon. 4,559,891, Cl. 114-263.000.
Showa Denko Kabushiki Kaisha: *See*—
Kobayashi, Yukio; Yamaguchi, Kinya; and Kira, Masaaki, 4,560,633, Cl. 429-213.000.
Showa Seiki Kabushiki Kaisha: *See*—
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,844, Cl. 200-5.00A.
Takamura, Toshiro; and Kakumu, Muneharu, 4,560,845, Cl. 200-5.00A.
Showalter, Thomas W.: *See*—
Gardner, John F.; and Showalter, Thomas W., 4,559,967, Cl. 137-340.000.
Showscan Film Corporation: *See*—
Trumball, Douglas, 4,560,260, Cl. 352-40.000.
Shozen, Daisaku: *See*—
Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, 4,559,687, Cl. 29-157.00C.
Shtarkman, Emile M., to Imperial Clevite Inc. Dry viscous spring strut. 4,560,150, Cl. 267-35.000.
Shudo, Yasunobu; Kano, Masayoshi; Murahashi, Tatsuya; Nakai, Yasuo; and Hosogaya, Kazuyoshi, to Hitachi Shipbuilding & Engineering Co., Ltd. Ship for transporting coal slurry. 4,559,888, Cl. 114-74.00R.
Shukla, Ravindra S.: *See*—
Bauer, Henry W., III; and Shukla, Ravindra S., 4,560,650, Cl. 435-15.000.
Siadat, Bahram; and Morgan, Charles R., to W. R. Grace & Co. Process for coating of substrates with heat curable coating. 4,560,579, Cl. 427-45.100.
Siano, Frank S., to Thomas & Betts Corporation. Chip carrier connector. 4,560,217, Cl. 339-14.00R.
Siano, James N.: *See*—
Hall, John B.; Sanders, James M.; and Siano, James N., 4,560,499, Cl. 252-522.00R.
Sibit S.p.A.: *See*—
Vanni, Sergio; Guidi, Loris; Vallini, Paolo; Pace, Renato C.; and Scotti, Carlo, 4,560,384, Cl. 8-94.210.
SICIM SpA: *See*—
Geat, Mario; and Dornik, Luciano, 4,560,377, Cl. 604-68.000.
Sicowa Verfahrenstechnik fuer Baustoffe GmbH & Co. KG: *See*—
Schulz, Eckhard, 4,560,346, Cl. 432-24.000.
Sidinter S.A.: *See*—
Perreau, Alain P.; and Perreau, Jean-Louis, 4,560,167, Cl. 273-184.00A.
Sieber, Albrecht: *See*—
Flaig, Ulrich; Grieshaber, Hermann; Sieber, Albrecht; and Wietelmann, Jurgen, 4,559,914, Cl. 123-359.000.
Siebert, Craig. Half block bearing assembly. 4,560,290, Cl. 384-434.000.
Siebold, Horst: *See*—
Forster, Helmut; Siebold, Horst; and Heinzelmann, Karl-Georg, 4,560,933, Cl. 324-319.000.
Siedle, Allen R., to Minnesota Mining and Manufacturing Company. Method for preparing palladium(II)(hexafluoroacetylacetonate). 4,560,780, Cl. 556-40.000.
Siegel, Florence. Puzzle formed of geometric pieces having an even number of equilateral sides. 4,561,097, Cl. 273-157.00R.
Siemens Aktiengesellschaft: *See*—
Forster, Helmut; Siebold, Horst; and Heinzelmann, Karl-Georg, 4,560,933, Cl. 324-319.000.
Futterer, Augustin, 4,560,951, Cl. 331-107.00A.
Hirschberg, Jakub, 4,560,157, Cl. 271-126.000.
Pierrel, Hans-Joachim, 4,560,841, Cl. 179-81.00R.
Prestele, Karl, 4,559,831, Cl. 73-861.050.
Thinschmidt, Hans; and Mittelmann, Rudolf, 4,561,118, Cl. 455-608.000.
Tihanyi, Jeno; and Stengl, Jens P., 4,561,003, Cl. 357-23.400.
Wolfram, Roland, 4,560,904, Cl. 315-3.500.
Siemens Gammasonics, Inc.: *See*—
Meeder, Raymond L., 4,560,876, Cl. 250-363.00S.
Sienkiewicz, Joseph A. Fishing fly. 4,559,736, Cl. 43-42.250.
Sillion, Bernard: *See*—
Denis, Jacques; Senneron, Michel; and Sillion, Bernard, 4,560,490, Cl. 252-51.50A.
Simington, Jack F. Saw chain grinder. 4,559,851, Cl. 76-40.000.
Simmons, Gerald P.: *See*—
Eftefield, Larry G.; Simmons, Gerald P.; and Stone, Gregory L., 4,560,207, Cl. 299-10.000.
Simon, B. Kenneth. Package for hazardous materials. 4,560,069, Cl. 206-591.000.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; and Crump, Druce K., to Dow Chemical Company, The. Bone seeking Tc-99m complexes of phosphonate derivatives of bis(aminoalkyl)piperazine. 4,560,548, Cl. 424-1.100.
Simpson Strong-Tie, Company, Inc.: *See*—
Gilb, Tyrell T., 4,560,301, Cl. 403-232.100.
Singer Company, The: *See*—
Klopp, Jerome C.; and Willigman, John, 4,560,846, Cl. 200-38.00R.
Zylbert, Thaddeus J., 4,559,886, Cl. 112-302.000.
Singer, John J., to Ciba-Geigy Corporation. Process for the production of ethylenediamine tetraacetonitrile. 4,560,516, Cl. 260-465.50A.
Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, 4,560,691, Cl. 514-300.000.
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,560,753, Cl. 544-279.000.
Sink, William H.: *See*—
Flotow, Richard A.; and Sink, William H., 4,560,048, Cl. 192-70.120.
Sipin, Anatole J., to Smith Meter Inc. Meter for measuring mass flow rate. 4,559,833, Cl. 73-861.380.
Sita, Richard K.; Orr, John R.; and Waring, John L., to RCA Corporation. Rotating D.C. coupled record amplifier for digital magnetic recording. 4,561,027, Cl. 360-39.000.
Sivaco Quebec: *See*—
Vider, Leslie, 4,560,349, Cl. 432-223.000.
Sivilotti, Olivo G., to Alcan International Limited. Metal production by electrolysis of a molten electrolyte. 4,560,449, Cl. 204-70.000.
Sjoberg, Eigel. Apparatus for hoof working. 4,560,006, Cl. 168-48.00A.
Skan-A-Matic Corp.: *See*—
Eastman, Jay M.; and Boles, John A., 4,560,862, Cl. 235-467.000.
SKF Kugellagerfabriken GmbH: *See*—
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.
Brandenstein, Manfred; Haas, Roland; and Hartmann, Hein, 4,560,051, Cl. 192-98.000.
SKF Nova AB: *See*—
Nilsson, Sven W., 4,559,843, Cl. 74-451.000.
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, to Schering Aktiengesellschaft. $\Delta^{8,9}$-Prostaglandin derivatives, their preparation and use as medicinal agents. 4,560,786, Cl. 560-55.000.
SKW Trostberg Aktiengesellschaft: *See*—
Smutek, Gerhard; and Raveling, Hermann, 4,560,796, Cl. 564-104.000.
Smith, Brian C. Exercise device for swimmers. 4,560,160, Cl. 272-133.000.
Smith, Eugene F.; and Nguyen, Tuan A., to Ball Corporation. Increased strength for metal beverage closure through reforming. 4,559,801, Cl. 72-348.000.
Smith, Fred J.: *See*—
Duel, Don M.; and Smith, Fred J., 4,559,708, Cl. 33-178.00R.
Smith International, Inc.: *See*—
Geczy, Bela A., 4,560,014, Cl. 175-107.000.
Kar, Nareshchandra J.; and Roth, Cary A., 4,560,175, Cl. 277-92.000.
Smith, James W.; and Ehlers, Jerry W., to Standard Oil Company. Method and apparatus for selecting inverse power weighting prior to vertically stacking acquired seismic data for suppressing noise. 4,561,075, Cl. 367-46.000.
Smith, Maurice D., to Whiting, Dennis W., a part interest. Small animal harness. 4,559,906, Cl. 119-96.000.
Smith Meter Inc.: *See*—
Sipin, Anatole J., 4,559,833, Cl. 73-861.380.
Smith and Nephew Associated Companies p.l.c.: *See*—
Metcalfe, Peter J., 4,559,938, Cl. 128-156.000.
Smith, Norman A.: *See*—
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.
Smith, Rae; and Moratto, Patricia. Convertible garment. 4,559,647, Cl. 2-158.000.

Smith, Robert W.: *See*—
Bedell, John R.; Smith, Robert W.; and Liebermann, Howard H., 4,559,992, Cl. 164-463.000.
Smith, Roger L.: *See*—
Bolenbaugh, Daniel L.; Wegh, John R.; and Smith, Roger L., 4,560,039, Cl. 188-73.450.
Smuckler, Jack H. Method of manufacturing a positive temperature coefficient resistive heating element. 4,560,524, Cl. 264-105.000.
Smutek, Gerhard; and Raveling, Hermann, to SKW Trostberg Aktiengesellschaft. Process for the modification of the crystal form of dicyandiamide. 4,560,796, Cl. 564-104.000.
Snamprogetti S.p.A.: *See*—
Berti, Alfredo; Mussati, Werther; and Bruschi, Roberto, 4,560,188, Cl. 285-47.000.
Sneijers, Andreas P. E.; Claassens, Jacobus M. M.; and Van den Plas, Roger J. Q., to U.S. Philips Corporation. High pressure discharge lamp. 4,560,903, Cl. 313-625.000.
Snider, Bruno, to Sogimi s.r.l. Reactive polymers for dermal and transdermal therapy. 4,560,555, Cl. 424-78.000.
Snow, Corinne M. Solar collector assembly. 4,559,925, Cl. 126-430.000.
S.p.A. Luigi Rizzi & C.: *See*—
Repetto, Silvio, 4,559,794, Cl. 69-43.000.
S.A. Arlux: *See*—
Batard, Denis; Freland, Jean-Claude; Wallez, Bernard; Desffains, J. Paul; and Valle, Roger, 4,559,933, Cl. 128-78.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; and Pressaco, Pierre, 4,560,209, Cl. 303-22.00R.
Gerard, Jean-Louis; Le Marchand, Claude; and Raguier, Marcel, 4,560,038, Cl. 188-73.380.
Morin, Gerard, 4,559,692, Cl. 29-441.00R.
Tourneur, Roger, 4,560,036, Cl. 188-73.320.
Societe Anonyme Dite-Delas-Weir: *See*—
Andrieux, Bernard, 4,559,996, Cl. 165-76.000.
Sodal, Ingvar E.: *See*—
Bowman, Ronald R.; and Sodal, Ingvar E., 4,560,871, Cl. 250-288.000.
Sofranko, John A.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,560,821, Cl. 585-500.000.
Sogimi s.r.l.: *See*—
Snider, Bruno, 4,560,555, Cl. 424-78.000.
Sokolowski, Robert C.: *See*—
Harke, Elwood W.; Sokolowski, Robert C.; and Johnson, Russell L., 4,560,527, Cl. 264-500.000.
Solavolt International: *See*—
Ackerman, Charles B., 4,560,244, Cl. 350-486.000.
Soltus, Michael; and Reese, James G., Jr., to RCA Corporation. Method for loading electron tubes in packages. 4,559,762, Cl. 53-441.000.
Soma, Takao; and Matsui, Minoru, to NGK Insulators, Ltd. Ceramic testing method. 4,559,824, Cl. 73-432.00R.
Sommerhoff, Gerd W. C., to Possum Controls Limited. Apparatus for forming moon characters for the visually handicapped. 4,559,706, Cl. 33-23.00R.
Sone, Takanori: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,560,755, Cl. 544-363.000.
Sonehara, Tomio; Murata, Masami; and Ota, Tadashi, to Kabushiki Kaisha Suwa Seikosha. Driving circuit for liquid crystal electro-optical device. 4,560,982, Cl. 340-784.000.
Sony Corporation: *See*—
Guisinger, Barrett E., 4,561,028, Cl. 360-77.000.
Okanobu, Taiwa, 4,560,920, Cl. 323-315.000.
Soula, Gerard, to Rhone-Poulenc Specialites Chimiques. Process for alkylating halogenated and trifluoromethylated benzene compounds. 4,560,814, Cl. 570-144.000.
Soultanian, Setrak D., to Wen Products, Inc. Electronic charging circuit for battery operated appliances. 4,560,915, Cl. 320-35.000.
Souren, Hubertus J., to Grolsche Bierbrouwerij B.V. Stationary beer container. 4,560,091, Cl. 222-155.000.
Southern Imperial, Inc.: *See*—
Valiulis, Stanley C., 4,560,062, Cl. 206-44.00R.
Southwell, Sandra R. H. Disposable panty for menstrual wear. 4,560,381, Cl. 604-396.000.
Souza, David W. Variable quantity dispensing device for granular material. 4,560,092, Cl. 222-168.000.
Sovey, James S.: *See*—
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,560,577, Cl. 427-38.000.
Spagnoli, Roberto: *See*—
Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, 4,560,662, Cl. 435-253.000.
Sparks, Joseph B.: *See*—
Jenkins, Scott A.; and Sparks, Joseph B., 4,560,304, Cl. 405-74.000.
Spence, David C.; and Schwartz, William A., to Air Products and Chemicals, Inc. Heat balance control in catalytic dehydrogenation of isobutane. 4,560,824, Cl. 585-662.000.
Sperry Corporation: *See*—
Currie, Thomas P., 4,561,006, Cl. 357-28.000.
DeKarske, Clarence W.; and Wilcoski, Thomas M., 4,560,939, Cl. 328-72.000.
Mast, Aquila D., 4,559,770, Cl. 56-341.000.
McDorman, Thomas W.; and Myers, David K., 4,561,035, Cl. 360-137.000.
Spickett, Robert G. W.; Mauri, Jacinto M.; and Puchades, Jesus E. B., to Anphar S.A. Basic aluminum magnesium carbonate. 4,560,545, Cl. 423-430.000.
Spiel, Albert, to Nabisco Brands, Inc. Rye flavoring. 4,560,573, Cl. 426-622.000.
Spirax Sarco, Inc.: *See*—
Jiandani, Niranjan T., 4,560,105, Cl. 236-58.000.
Spiteri, Pierre: *See*—
Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, 4,559,993, Cl. 165-1.000.
Spivack, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. Tri- and Tetra-(substituted hydroxyphenylthio) alkane and cycloalkane stabilizers and stabilized compositions. 4,560,799, Cl. 568-47.000.
Sprague, Robert A., to Xerox Corporation. Two dimensional electro-optic modulator for printing. 4,560,994, Cl. 346-108.000.
SPRI Limited: *See*—
Kitchen, Terence J., 4,559,812, Cl. 73-59.000.
Spry, Douglas O., to Eli Lilly and Company. Cephem-3-imidates and 3-amidines. 4,560,749, Cl. 544-16.000.
Square D Company: *See*—
Schwartz, Wesley W., 4,560,130, Cl. 248-297.200.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Oligomers of perfluoro(2,2-dimethyl-1,3-dioxole) and their fluorination products. 4,560,778, Cl. 549-455.000.
SS Pharmaceutical Co., Ltd.: *See*—
Honda, Haruyoshi; Sato, Susumu; Isomae, Kazuo; Ookawa, Junji; and Kuwamura, Tsukasa, 4,560,785, Cl. 560-52.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Yarn piecing arrangement for an open-end friction spinning machine. 4,559,774, Cl. 57-263.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,559,774, Cl. 57-263.000.
Stahlecker, Peter H. Method and apparatus for restarting a yarn spinning apparatus. 4,559,773, Cl. 57-261.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive, positive-working copying material having a rough surface provided by pigments in light-sensitive layer. 4,560,636, Cl. 430-165.000.
Staker, Donald D.; and Kain, William S., to National Distillers and Chemical Corporation. Amino ester and amino amide-ester corrosion inhibitors for aqueous systems. 4,560,497, Cl. 252-392.000.
Stamicarbon B.V.: *See*—
van der Stoel, Roland E.; Bosma, Marcel A. R.; Janssen, Petrus H. J.; and van de Moesdijk, Cornelis G. M., 4,560,760, Cl. 546-243.000.
Stamicarbon B.V., Licensing Subsidiary of DSM: *See*—
Van Bokhoven, Petrus H. M.; and Van Asperen, Pieter J., 4,560,725, Cl. 525-67.000.
Standard Oil Company, The: *See*—
Attig, Thomas G.; Graham, Anne M.; and Pesa, Frederick, 4,560,672, Cl. 502-183.000.
Burrington, James D.; Grasselli, Robert K.; Pesa, Fred; and Maher, Elizabeth A., 4,560,730, Cl. 525-340.000.
Shaw, Wilfrid G., 4,560,673, Cl. 502-206.000.
Smith, James W.; and Ehlers, Jerry W., 4,561,075, Cl. 367-46.000.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; and Winzenburg, Mark L., 4,560,761, Cl. 546-283.000.
Hopkins, P. Donald; Nevitt, Thomas D.; and Unmuth, Eugene E., 4,560,469, Cl. 208-110.000.
Standard Oil Company (Ohio), The: *See*—
Harris, Jonathan H.; Tenhover, Michael A.; Grasselli, Robert K.; and Ward, Michael D., 4,560,454, Cl. 204-128.000.
Standard Precision, Inc.: *See*—
Papp, John E.; and Reed, Antony S., 4,560,212, Cl. 308-3.800.
Standard Telephones and Cables Public Limited Company: *See*—
Rokos, George H. S.; and Wilson, James S., 4,560,959, Cl. 331-176.000.
Stanley Electric Co. Ltd.: *See*—
Naete, Hidehiko; Funaoka, Chihiro; Augello, Daniel; and Coste, Jean-Claude, 4,560,885, Cl. 307-10.00R.
Stanley, Smith B.; and Alroy, Yoram A., to Alroy & Stanley Associates, Inc. Spectacles with extractable temples. 4,560,258, Cl. 351-115.000.
Stapp, Paul R., to Phillips Petroleum Company. Visbreaking of oils. 4,560,467, Cl. 208-89.000.
Starke, George W.: *See*—
Nicksic, Stephen W.; and Starke, George W., 4,560,663, Cl. 436-25.000.
Staub, Samuel, to Ferag AG. Apparatus for detecting multiple occupied positions in a continuously conveyed stream of printed products at uniform spacing and method of use of the apparatus. 4,560,159, Cl. 271-263.000.
Stauffer Chemical Company: *See*—
Goswami, Jagadish C., 4,560,618, Cl. 428-500.000.
Telschow, Jeffrey E.; and Weil, Edward D., 4,560,772, Cl. 549-240.000.
Telschow, Jeffrey E., 4,560,773, Cl. 549-240.000.
Staveley, John: *See*—
Lucas, Peter; and Staveley, John, 4,560,096, Cl. 224-42.420.
Steer, John E.; and Crumb, Donald A., to Allied Corporation. Master cylinder. 4,559,781, Cl. 60-562.000.
Steibel, James P. Combustible newspaper log. 4,560,389, Cl. 44-1.00R.
Steinberg, Richard W.: *See*—
Peterson, Richard L.; Johnson, James A.; Scheurer, Roger J.; and Steinberg, Richard W., 4,560,011, Cl. 172-194.000.
Steinberger, Josef; and Muller, Wilhelm, to Paul Forkardt GmbH & Co. KG. Chuck. 4,560,179, Cl. 279-15.000.

Steiner Company, Inc.: *See—*
Cassia, Antonio M., 4,560,093, Cl. 222-181.000.

Stemig, Heinz: *See—*
Stoldt, August; Stemig, Heinz; Breidohr, Hans-Gunther; and Martin, Manfred, 4,559,884, Cl. 112-262.100.

Stemmler, Kurt, to Winkler & Dunnebier Maschenfabrik und Eigengiesserei GmbH & Co. KG. Absorbent hygienic article and method of manufacture. 4,560,379, Cl. 604-368.000.

Steneck, Walter G.: *See—*
Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,560,908, Cl. 315-219.000.

Stengl, Jens P.: *See—*
Tihanyi, Jeno; and Stengl, Jens P., 4,561,003, Cl. 357-23.400.

Stepanov, Boris A.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Sterling Drug Inc.: *See—*
Lesher, George Y.; and Singh, Baldev, 4,560,691, Cl. 514-300.000.
Lesher, George Y.; Singh, Baldev; and Laskowski, Stanley C., 4,560,753, Cl. 544-279.000.

Stewart-Warner Corporation: *See—*
Shew, Jerry D., 4,560,095, Cl. 222-256.000.
Weaver, Frank C., 4,560,365, Cl. 464-52.000.

Stiksack STS S.A.: *See—*
Cowan, Michael A., 4,560,398, Cl. 428-35.000.

Stits, Raymond M. High tenacity polyester filament fabric. 4,559,975, Cl. 139-420.00R.

Stocker, John, to Hoffmann-La Roche Inc. Antibody/antigen determination method. 4,560,647, Cl. 435-5.000.

Stockton, Thomas R., to Ford Motor Company. Four-wheel drive clutch lubrication system. 4,560,056, Cl. 192-113.00B.

Stoessel, John: *See—*
Ibanez, Paul; Stoessel, John; and Barrett, Donald C., 4,560,016, Cl. 177-210.00R.

Stol, Israel. Helical elevating dispenser for round objects such as candies. 4,560,086, Cl. 221-24.000.

Stoldt, August; Stemig, Heinz; Breidohr, Hans-Gunther; and Martin, Manfred, to Akzo NV. Hollow thread bundle and method of its manufacture. 4,559,884, Cl. 112-262.100.

Stoll, Kurt. Electric linear drive with an external rotor electric motor. 4,560,894, Cl. 310-67.00R.

Stolov, Adi: *See—*
Stolov, Michael; and Stolov, Adi, 4,560,241, Cl. 350-339.00R.

Stolov, Michael; and Stolov, Adi. Liquid crystal device for multicolor images comprising thin protective glass plate. 4,560,241, Cl. 350-339.00R.

Stolz, Albert: *See—*
Waldmann, Heinrich; Halder, Prasanta; Volz, Wolfgang; and Stolz, Albert, 4,559,994, Cl. 165-41.000.

Stolz, Robert: *See—*
Bonengel, Roland; Dobhan, Herbert; Brandenstein, Manfred; Edelmann, Ludwig; Ernst, Horst M.; Kregler, Helmuth; Marx, Anton; Neder, Gunter; Mause, Elmar; Olschewski, Armin; Schurger, Rainer; and Stolz, Robert, 4,560,291, Cl. 384-533.000.

Stone, Gregory L.: *See—*
Eftefield, Larry G.; Simmons, Gerald P.; and Stone, Gregory L., 4,560,207, Cl. 299-10.000.

Storebraten, Sverre: *See—*
Kleppe, Peder J.; and Storebraten, Sverre, 4,560,437, Cl. 162-65.000.

Storey, Robert B., to BSP International Foundations Limited. Valve for a hydraulic ram. 4,559,863, Cl. 91-165.000.

Stork, Gilbert: *See—*
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,791, Cl. 560-254.000.
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,560,802, Cl. 568-388.000.

Stoutamire, Donald W.; and Tieman, Charles H., to Shell Oil Company. Preparation of optically-active cyanomethyl esters. 4,560,515, Cl. 260-465.00D.

Strain, Robert J.: *See—*
Anand, Kranti; and Strain, Robert J., 4,559,696, Cl. 29-576.00B.

Straits Steel & Wire Co.: *See—*
King, Clarence J., 4,560,073, Cl. 211-184.000.

Stranahan, Michael: *See—*
Lew, Hyok S.; and Stranahan, Michael, 4,560,986, Cl. 340-870.380.

Strandwitz, Peter: *See—*
McMillin, John R.; and Strandwitz, Peter, 4,560,089, Cl. 222-14.000.

Straszewski, Klaus: *See—*
Zeumer, Monika; and Straszewski, Klaus, 4,560,204, Cl. 297-483.000.

Strecker, William D.; Buzynski, John E.; and Thompson, David, to Digital Equipment Corp. Dual-count, round-robin distributed arbitration technique for serial buses. 4,560,985, Cl. 340-825.500.

Strickland, John J.: *See—*
Sugalski, Raymond K.; and Strickland, John J., 4,559,700, Cl. 29-623.100.

Strobel, Klaus: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,560,336, Cl. 425-78.000.

Strohl, Willi; and Jauch, Gerhard, to Robert Bosch GmbH. Pressure control valve. 4,559,968, Cl. 137-510.000.

Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., to North American Philips Corporation. High-frequency oscillator-inverter ballast circuit for discharge lamps. 4,560,908, Cl. 315-219.000.

Sturman, Barry T., to Varian Techtron Pty Limited. Gas/liquid separator and atomization cell. 4,559,808, Cl. 73-23.000.

Sturtz, Terry L.: *See—*
Newendorp, Bruce C.; Sturtz, Terry L.; and Anderson, Lawrence V., 4,559,847, Cl. 74-710.500.

Subich, Vadim N.: *See—*
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Waldmann, Heinrich; Halder, Prasanta; Volz, Wolfgang; and Stolz, Albert, 4,559,994, Cl. 165-41.000.

Sue, Takaji; and Sugie, Masatoshi, to Richo Company, Ltd. Recording paper feeding apparatus. 4,560,990, Cl. 346-17.000.

Suga, Masaaki: *See—*
Murasugi, Takashi; Morimoto, Yoshiro; Suga, Masaaki; and Niikura, Yasuhiro, 4,560,043, Cl. 192-3.310.

Suga, Tateo; Tamura, Hiroshi; Taguchi, Masaaki; and Suzuki, Tokio, to Yokogawa Hokushin Electric Corporation. Recorder with self loading feed. 4,560,995, Cl. 346-136.000.

Sugalski, Raymond K.; and Strickland, John J., to General Electric Company. Method for winding an electrode assembly. 4,559,700, Cl. 29-623.100.

Sugasawa, Tsutomu; Adachi, Makoto; Sasakura, Kazuyuki; Matsushita, Akira; and Eigyo, Masami, to Shionogi & Co., Ltd. 1,4-Benzodiazepine derivatives. 4,560,684, Cl. 514-221.000.

Sugawara, Fukuo; and Iwane, Yasuhiko, to Alps Electric Co., Ltd. Printer with multiple type groups. 4,560,294, Cl. 400-145.000.

Sugie, Masatoshi: *See—*
Sue, Takaji; and Sugie, Masatoshi, 4,560,990, Cl. 346-17.000.

Sugihara, Taisuke: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,560,755, Cl. 544-363.000.

Sugimoto, Hiroaki: *See—*
Ueno, Katsuji; Sugimoto, Hiroaki; and Hayatsu, Kazuo, 4,560,740, Cl. 528-125.000.

Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, to Sugino Machine Limited. Surgical nozzle apparatus. 4,560,373, Cl. 604-30.000.

Sugino Machine Limited: *See—*
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.

Sugino, Yoshihiro: *See—*
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.

Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, to House Food Industrial Company Limited. System for feeding liquid substances. 4,559,963, Cl. 137-1.000.

Sugita, Toshiaki: *See—*
Nakagawa, Masao; Mori, Kiyoshi; and Sugita, Toshiaki, 4,560,735, Cl. 526-232.300.

Sullivan, Donald F. Reusable phototransparency image forming tools for direct contact printing. 4,560,639, Cl. 430-273.000.

Sulzer Morat GmbH: *See—*
Leins, Eberhard, 4,559,792, Cl. 66-125.00R.

Sumitomo Cement Co., Ltd.: *See—*
Takagi, Shigehide; Yokota, Norio; Sato, Syohei; and Nishi, Toshihiro, 4,560,413, Cl. 106-120.000.

Sumitomo Chemical Company, Limited: *See—*
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.
Ueno, Katsuji; Sugimoto, Hiroaki; and Hayatsu, Kazuo, 4,560,740, Cl. 528-125.000.

Sumitomo Electric Industries, Ltd.: *See—*
Mitsui, Tsutomu; Tada, Konji; Kuhara, Yoshiki; and Tatsumi, Masami, 4,560,932, Cl. 324-244.000.
Nishiwaki, Yoshikazu; Matsuoka, Shunji; and Okamoto, Kenji, 4,560,249, Cl. 350-162.170.

Sumner, Earl C., to Duriron Company, Inc., The. Method of joining materials by mechanical interlock and article. 4,560,607, Cl. 428-141.000.

Sun Coast Plastics, Inc.: *See—*
Dutt, Herbert V., 4,560,077, Cl. 215-307.000.

Suncor, Inc.: *See—*
Yong, Raymond N.; and Sethi, Amar J., 4,560,416, Cl. 127-33.000.

Superior Electric Company, The: *See*—
Lenzing, Richard S., 4,560,970, Cl. 336-149.000.

Superior Graphite: *See*—
Goldberger, William M.; and Reed, Allan, 4,560,409, Cl. 75-130.00R.

Supper, Ottmar: *See*—
Grimm, Hermann; Volz, Wolfgang; Supper, Ottmar; and Pfeiffer, Martin, 4,560,973, Cl. 338-28.000.

Susaki, Wataru: *See*—
Namizaki, Hirofumi; Hirano, Ryoichi; Higuchi, Hideyo; Oomura, Etsuji; Sakakibara, Yasushi; and Susaki, Wataru, 4,561,096, Cl. 372-46.000.

Sutch, Brian L. C. Lid and container having tamperproof means. 4,560,082, Cl. 220-270.000.

Suyama, Tadakazu: *See*—
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.

Suzuki, Hiroshi: *See*—
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Suzuki, Kenji: *See*—
Matsumura, Susumu; Suzuki, Takashi; and Suzuki, Kenji, 4,560,863, Cl. 250-201.000.

Suzuki, Kunihiko; and Enomoto, Koji, to Nissan Motor Company, Limited. Part-time four-wheel drive system having locking clutches between wheel and axle shaft. 4,560,025, Cl. 180-247.000.

Suzuki, Motoyoshi: *See*—
Noda, Munetaka; Muto, Takahiko; Suzuki, Motoyoshi; and Ninoyu, Yutaka, 4,560,024, Cl. 180-176.000.

Suzuki, Ryoichi: *See*—
Namai, Akihiro; and Suzuki, Ryoichi, 4,560,266, Cl. 354-400.000.

Suzuki, Takashi: *See*—
Matsumura, Susumu; Suzuki, Takashi; and Suzuki, Kenji, 4,560,863, Cl. 250-201.000.

Suzuki, Tokio: *See*—
Suga, Tateo; Tamura, Hiroshi; Taguchi, Masaaki; and Suzuki, Tokio, 4,560,995, Cl. 346-136.000.

Suzuki, Toshio, to Toray Silicone Company, Ltd. Transparent organopolysiloxane compositions. 4,560,711, Cl. 523-212.000.

Suzuki, Yasuo: *See*—
Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, 4,560,404, Cl. 75-0.50C.

Suzuki, Yukio: *See*—
Matsuo, Takeshi; and Suzuki, Yukio, 4,560,634, Cl. 430-84.000.

Svensson, Sven A.; Oledal, Bo J. M.; and Lofgren, Stig-Gunnar E., to KMW Aktiebolag. Barking drum with at least one bearing ring. 4,559,986, Cl. 144-208.00B.

Svistunov, Vladimir E.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Svoboda Entwicklungs KG: *See*—
Svoboda, Rudolf, 4,560,137, Cl. 248-652.000.

Svoboda, Rudolf, to Svoboda Entwicklungs KG. Positioning device for a supported article. 4,560,137, Cl. 248-652.000.

Swanson, William E.: *See*—
Emmons, Daniel R.; and Swanson, William E., 4,561,066, Cl. 364-736.000.

SWF Auto-Electric GmbH: *See*—
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.

Swift, Gregory W.: *See*—
Migliori, Albert; and Swift, Gregory W., 4,560,849, Cl. 219-10.510.

Sydenham, Peter E.: *See*—
Molloy, James O.; Sydenham, Peter E.; and Hulejczuk, Roman A., 4,560,007, Cl. 169-54.000.

Syntex (U.S.A.) Inc.: *See*—
Armenta, Richard, 4,560,648, Cl. 435-7.000.
Briggs, Jonathan, 4,560,881, Cl. 250-458.100.
Muchowski, Joseph M.; and Unger, Stefan H., 4,560,699, Cl. 514-413.000.

Szalanski, Scott E., to Rexnord Inc. Convertible vertical shaft impact crusher. 4,560,113, Cl. 241-275.000.

Szekely, Eva; and Szekely, Roza, to Magyar Szenhidrogenipari Kutato-Fejleszto Intezet. Fire-fighting powders. 4,560,485, Cl. 252-7.000.

Szekely, Roza: *See*—
Szekely, Eva; and Szekely, Roza, 4,560,485, Cl. 252-7.000.

T.A.D. Avanti, Inc.: *See*—
Bond, Raymond G.; and Batla, Masroor A., 4,560,832, Cl. 179-2.0EA.

T. Giusti & Son Ltd.: *See*—
Giusti, Glyn R., 4,559,980, Cl. 141-11.000.

TAB Leasing: *See*—
Nelson, Craig E., 4,559,826, Cl. 73-632.000.

Tabak, Samuel A., to Mobil Oil Corporation. Catalytic conversion with catalyst regeneration sequence. 4,560,536, Cl. 422-116.000.

Tabak, Samuel A., to Mobil Oil Corporation. Multistage process for converting oxygenates to hydrocarbons. 4,560,537, Cl. 422-190.000.

Tada, Konji: *See*—
Mitsui, Tsutomu; Tada, Konji; Kuhara, Yoshiki; and Tatsumi, Masami, 4,560,932, Cl. 324-244.000.

Tada, Naofumi: *See*—
Aihara, Katsuzo; Tada, Naofumi; Suzuki, Yasuo; Ishihara, Joo; and Ogawa, Toshio, 4,560,404, Cl. 75-0.50C.

Tadokoro, Hideo, to Oki Electric Industry Co., Ltd. Method and apparatus for drying semiconductor wafers. 4,559,718, Cl. 34-8.000.

Taft, Philip A., to Lucas Industries Limited. Power valve for a vehicle braking system. 4,559,780, Cl. 60-548.000.

Taguchi, Hiromi, to Nissan Motor Co., Ltd. Mounting setup of governor shaft. 4,559,842, Cl. 74-336.500.

Taguchi, Masaaki: *See*—
Suga, Tateo; Tamura, Hiroshi; Taguchi, Masaaki; and Suzuki, Tokio, 4,560,995, Cl. 346-136.000.

Taguchi, Masao: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,559,963, Cl. 137-1.000.

Taipale, Dale L.: *See*—
Flaig, John D.; and Taipale, Dale L., 4,559,908, Cl. 123-41.280.

Tajima, Hatsuo: *See*—
Kan, Fumitaka; Egami, Hidemi; Hosoi, Atsushi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,559,899, Cl. 118-657.000.

Takafuji, Hideo; Minamida, Katsuhiro; and Yamaguchi, Shigehiro, to Nippon Steel Corporation. Method for joining of articles by energy beam and apparatus for controlling said method. 4,560,855, Cl. 219-121.0LD.

Takagi, Mitiro: *See*—
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Takagi, Shigehide; Yokota, Norio; Sato, Syohei; and Nishi, Toshihiro, to Sumitomo Cement Co., Ltd. Gamma-dicalcium silicate-containing cement composition. 4,560,413, Cl. 106-120.000.

Takagi, Toshinori: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,559,901, Cl. 118-723.000.

Takahashi, Hirotake: *See*—
Uchibaba, Kouichi; Takahashi, Hirotake; and Uchiyama, Chiyomitsu, 4,560,049, Cl. 192-85.00R.

Takahashi, Naoki, to Kabushiki Kaisha Ishida Koki Seisakusho. Printer comprising spring biased print head and roller platen. 4,560,292, Cl. 400-59.000.

Takahashi, Nobuaki: *See*—
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.

Takahashi, Norimichi: *See*—
Kitazawa, Toshiyuki; Morisawa, Tahei; and Takahashi, Norimichi, 4,560,264, Cl. 354-219.000.

Takai, Mitsuo: *See*—
Tanahashi, Takashi; Takai, Mitsuo; and Uemura, Masahito, 4,559,651, Cl. 4-443.000.

Takamatsu, Shuhei: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,560,764, Cl. 548-190.000.

Takami, Masaho, to Shoko Kiko Co., Ltd. Apparatus for regulating the tension of a strap in a package strapping machine. 4,559,767, Cl. 53-589.000.

Takamizawa, Minoru: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,560,589, Cl. 427-249.000.

Takamura, Toshiro; and Kakumu, Muneharu, to Brother Kogyo Kabushiki Kaisha; and Showa Seiki Kabushiki Kaisha. Key-holding structure of a keyboard with curved operating surface of keys. 4,560,844, Cl. 200-5.00A.

Takamura, Toshiro; and Kakumu, Muneharu, to Brother Kogyo Kabushiki Kaisha; and Showa Seiki Kabushiki Kaisha. Keyboard. 4,560,845, Cl. 200-5.00A.

Takamura, Yoshio; and Nakajima, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiple step-up rectifier circuit. 4,561,048, Cl. 363-60.000.

Takasago Electric Industry Co., Ltd.: *See*—
Hamano, Junichi, 4,560,161, Cl. 273-85.0CP.

Takayama, Shigehiko; Maruyama, Masanori; and Fukushima, Masakazu, to Hitachi, Ltd. Electron beam focusing lens. 4,560,899, Cl. 313-449.000.

Takayama, Syuichi, to Olympus Optical Co., Ltd. Endoscope apparatus with motor-driven bending mechanism. 4,559,928, Cl. 128-6.000.

Takayasu, Makoto: *See*—
Friedlaender, Fritz J.; and Takayasu, Makoto, 4,560,484, Cl. 210-796.000.

Takeda Chemical Industries, Ltd.: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,560,508, Cl. 260-239.00A.

Takeda, Yukio: *See*—
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, 4,561,010, Cl. 357-74.000.

Takemoto, Masao: *See*—
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,560,625, Cl. 428-654.000.

Takenouchi, Mutsuo; Ozawa, Takashi; Hamano, Toshihita; Fuse, Mario; Nakamura, Takeshi; and Itoh, Hisao, to Fuji Xerox Co., Ltd. Image pick-up apparatus with folding optics. 4,560,866, Cl. 250-216.000.

Takigawa, Jun: *See—*
Kaifu, Masaharu; Takigawa, Jun; Fujimoto, Hideo; Nishimura, Tomohiro; and Takemoto, Masao, 4,560,625, Cl. 428-654.000.

Talley, John J.; Evans, Irene A.; and Lewis, Michael D., to General Electric Company. Catalytic dealkylation of alkylated phenols. 4,560,810, Cl. 568-805.000.

Tamaki, Makoto: *See—*
Sato, Jinichi; Kurusu, Toshiro; Kondo, Naoyoshi; and Tamaki, Makoto, 4,560,571, Cl. 426-594.000.

Tamazaki, Kazunori: *See—*
Nishimatsu, Masaharu; Kubota, Yuichi; Tamazaki, Kazunori; and Shimada, Shigeru, 4,560,617, Cl. 428-423.100.

Tamura, Hifumi; Okano, Hiroshi; Ishitani, Tohru; and Shimase, Akira, to Hitachi, Ltd. Ion source. 4,560,907, Cl. 315-111.010.

Tamura, Hiroshi: *See—*
Suga, Tateo; Tamura, Hiroshi; Taguchi, Masaaki; and Suzuki, Tokio, 4,560,995, Cl. 346-136.000.

Tamura, Takahiro: *See—*
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.

Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image processing method and apparatus. 4,561,024, Cl. 358-287.000.

Tan, Larry K. Vending machine with dispensing operating system movable in X-Y coordinate axes. 4,560,088, Cl. 221-75.000.

Tanabe, Minoru, to Matsushita Electric Industrial Company, Limited. Automatic cassette loading apparatus. 4,561,031, Cl. 360-96.500.

Tanahashi, Takashi; Takai, Mitsuo; and Uemura, Masahito, to Matsushita Electric Industrial Co., Ltd. Hot-water washing apparatus for personal hygiene. 4,559,651, Cl. 4-443.000.

Tanaka, Kenji: *See—*
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.

Tanaka, Kunihiko: *See—*
Kamiya, Takashi; Tanaka, Kunihiko; Nakai, Yoshiharu; and Sakane, Kazuo, 4,560,765, Cl. 548-194.000.

Tanaka, Tetsuo: *See—*
Ogura, Takashi; Hirohara, Toshihide; Matsunaga, Masaaki; Kamiya, Kiyoshi; and Tanaka, Tetsuo, 4,561,044, Cl. 362-84.000.

Tani, Masanori; Eto, Shin'ichi; and Funakoshi, Takeshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Brake system for vehicles. 4,560,210, Cl. 303-22.00R.

Taniguchi, Nobuyuki: *See—*
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,560,267, Cl. 354-412.000.

Tanisake, Hiroka: *See—*
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.

Tanoue, Yasuhiro: *See—*
Terada, Akira; and Tanoue, Yasuhiro, 4,560,511, Cl. 260-396.00R.

Tantawi, Ahmed M. Safety case for the medical glass thermometer. 4,560,287, Cl. 374-194.000.

Tarkan, Yusaf: *See—*
Lichti, Robert D., 4,559,660, Cl. 14-71.500.

Tarumi, Yasuo: *See—*
Mori, Shigeru; and Tarumi, Yasuo, 4,560,784, Cl. 556-401.000.

Tateno, Haruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Instruction prefetch system. 4,561,052, Cl. 364-200.000.

Tatsuguchi, Mikio: *See—*
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.

Tatsumi, Masami: *See—*
Mitsui, Tsutomu; Tada, Konji; Kuhara, Yoshiki; and Tatsumi, Masami, 4,560,932, Cl. 324-244.000.

Taya, Tosiki: *See—*
Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, 4,560,332, Cl. 418-83.000.

Taylor, Colin: *See—*
Harris, David L.; and Taylor, Colin, 4,560,281, Cl. 366-15.000.

Taylor, Donald K.; Rogers, William; McGary, Vernon; and Lenart, Peter, to C.S.E. Automation Engineering Services, Inc. Pilot control relay valve apparatus. 4,559,970, Cl. 137-557.000.

Taylor, Harold M.: *See—*
Hirsch, Kenneth S.; Jones, Charles D.; Taylor, Harold M.; and Winter, Mark A., 4,560,695, Cl. 514-372.000.

TDK Corporation: *See—*
Nishimatsu, Masaharu; Kubota, Yuichi; Tamazaki, Kazunori; and Shimada, Shigeru, 4,560,617, Cl. 428-423.100.

Teagle, David A.: *See—*
Bones, Roger J.; Galloway, Roy C.; Coetzer, Johan; and Teagle, David A., 4,560,627, Cl. 429-103.000.

Teague, E. Clayton: *See—*
Scire, Fredric E.; and Teague, E. Clayton, 4,559,717, Cl. 33-568.000.

Technobal S.A.: *See—*
Cornu, Roger; and Meier, Pierre-Andre , 4,560,926, Cl. 324-158.00P.

Technomex Development, Ltd.: *See—*
Bardina, Juan; and Gonzalez, Mikel, 4,560,417, Cl. 134-1.000.

Technovators, Inc.: *See—*
Fisher, Glen W., 4,560,285, Cl. 366-341.000.

Tectron (ENG) Ltd.: *See—*
Needham, Arthur M., 4,559,815, Cl. 73-119.00A.

Tecumseh Products Company: *See—*
Kessler, Donald L., 4,559,686, Cl. 29-156.50R.

Tegel, Othmar; and Gill, Hardial S., to ANT Nachrichtentechnik GmbH. Cavity-stabilized microwave oscillator. 4,560,952, Cl. 331-107.0DP.

Tektronix, Inc.: *See—*
Cabot, Richard C., 4,560,950, Cl. 331-1.00A.
Cabot, Richard C., 4,560,957, Cl. 331-135.000.
Deleganes, Sam M.; and Den Beste, Steven C., 4,561,049, Cl. 364-130.000.
Hofer, Bruce E., 4,560,958, Cl. 331-135.000.
Jackson, Ronald M.; Olin, Daniel C.; and Anderson, Russell Y., 4,560,981, Cl. 340-747.000.
Radochonski, Pierre; Kniffin, John M.; Eriksen, Joern B.; Rogers, Jerrold J.; and Gellatly, William W., 4,560,989, Cl. 346-1.100.
Wimmer, Guenther W., 4,560,998, Cl. 346-140.00R.

Tekulve, Daniel R.: *See—*
Laskowski, Donald R.; and Tekulve, Daniel R., 4,559,858, Cl. 83-801.000.

Telefonaktiebolaget LM Ericsson: *See—*
Lenell, Lars A., 4,560,843, Cl. 179-170.0NC.
Ulming, Lennart E., 4,559,969, Cl. 137-540.000.

Tell, Lars E. K. A.; and Johannesson, Carl C. E., to KMW Aktiebolag. Method and apparatus for reducing the energy consumed when drying a paper web. 4,560,438, Cl. 162-194.000.

Telschow, Jeffrey E.; and Weil, Edward D., to Stauffer Chemical Company. Preparation of substituted phthalic anhydrides. 4,560,772, Cl. 549-240.000.

Telschow, Jeffrey E., to Stauffer Chemical Company. Process for preparing substituted phthalic anhydrides. 4,560,773, Cl. 549-240.000.

Tenhover, Michael A.: *See—*
Harris, Jonathan H.; Tenhover, Michael A.; Grasselli, Robert K.; and Ward, Michael D., 4,560,454, Cl. 204-128.000.

Terabe, Mahito: *See—*
Miwa, Kiyoshi; Terabe, Mahito; Ishida, Masaaki; Matsui, Hiroshi; and Momose, Haruo, 4,560,654, Cl. 435-115.000.

Terada, Akira; and Tanoue, Yasuhiro, to Kyushu Institute of Technology. Method of producing shikonin. 4,560,511, Cl. 260-396.00R.

Teramachi, Kazuo: *See—*
Kayanoki, Katsuhiko; Teramachi, Kazuo; Ono, Seigo; and Hashimoto, Yasuyuki, 4,560,054, Cl. 192-106.200.

Terasawa, Hidenori, to Nippon Kogaku K.K. Projection lens. 4,560,243, Cl. 350-469.000.

Terazawa, Takayuki: *See—*
Fukushima, Nobuo; Kitamura, Shuji; Nakae, Kiyohiko; Kotani, Kozo; Terazawa, Takayuki; and Nakarai, Toyoaki, 4,560,609, Cl. 428-220.000.

Terp, Leslie S., to Garrett Corporation, The. Stabilization of automotive vehicle. 4,560,121, Cl. 244-3.220.

Terumo Corporation: *See—*
Isono, Keinosuke, 4,560,382, Cl. 604-408.000.

Terumo Kabushiki Kaisha: *See—*
Aoyagi, Juuro; Ichikawa, Toshiji; Koide, Mikio; and Shimomura, Takeshi, 4,560,720, Cl. 524-288.000.
Murase, Masakazu, 4,559,954, Cl. 128-736.000.

Teruyuki, Ohba; Kazuo, Arai; Atushi, Yahagi; and Shigeru, Iwakoshi, to Iwata Air Compressor Mfg. Co., Ltd. Shaft sealing device for sliding portion of needle valve in paint spray gun. 4,560,109, Cl. 239-583.000.

Terwoerds, Francis J.: *See—*
Cochran, Stephen C.; and Terwoerds, Francis J., 4,559,846, Cl. 74-665.0GA.

Tetra Pak Development SA: *See—*
Rausing, Hans; and Rauser, Marita, 4,560,570, Cl. 426-564.000.

Tetra Pak Developpement SA: *See—*
Rausing, Hans A., 4,560,567, Cl. 426-399.000.

Texaco Inc.: *See—*
Davis, Lorne A., Jr.; and Haskin, Helen K., 4,560,002, Cl. 166-252.000.
Higgs, Kenneth O.; and Everett, Jimmy D., 4,559,811, Cl. 73-59.000.
Morduchowitz, Abraham; and Sammells, Anthony F., 4,560,450, Cl. 204-75.000.

Texas Instruments: *See—*
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, 4,561,004, Cl. 357-23.500.

Texas Instruments Incorporated: *See—*
Leach, Jerald G., 4,560,954, Cl. 331-108.00B.

Texstyrene Plastics, Inc.: *See—*
Harrison, James M., 4,560,705, Cl. 521-60.000.

Tezuka, Yoshitomo; Nakagawa, Takeo; and Kobayashi, Kazusuke, to Aida Engineering, Ltd. Steel fiber for reinforcing concrete and production thereof. 4,560,622, Cl. 428-599.000.

Tharel, Morene J., to Flare Products, Inc. Disposable therapy diaper. 4,560,380, Cl. 604-385.00R.

Thelen, Robert L.: *See—*
Rouse, Michael W.; and Thelen, Robert L., 4,560,112, Cl. 241-236.000.

Thelen, Werner: *See—*
Schulz, Joachim; and Thelen, Werner, 4,560,103, Cl. 236-13.000.

Theodor Heimeier Metallwerk GmbH: *See—*
Tolle, Hans; Frech, Karl; and Ludke, Hartmut, 4,560,586, Cl. 427-134.000.

Thermal-Barrier Products, Inc.: *See—*
Bayer, Michael S., 4,559,739, Cl. 49-177.000.

Thermo King Corporation: *See—*
Friedland, Anthony E., 4,560,592, Cl. 427-430.100.
Thevenin, Michel: *See—*
Pierrey, Jean-Louis; and Thevenin, Michel, 4,560,530, Cl. 376-290.000.
Thillays, Jacques C., to U.S. Philips Corporation. Light-emitting device having at least two semiconductor crystals. 4,560,901, Cl. 313-499.000.
Thinschmidt, Hans; and Mittelmann, Rudolf, to Siemens Aktiengesellschaft. Bus system with optical waveguides having collision detection. 4,561,118, Cl. 455-608.000.
Thom McI, Inc.: *See—*
Thompson, Thomas L., 4,559,894, Cl. 114-45.000.
Thomas & Betts Corporation: *See—*
Siano, Frank S., 4,560,217, Cl. 339-14.00R.
Thomas, Harvel W.: *See—*
Thomas, Philip D.; and Thomas, Harvel W., 4,560,146, Cl. 254-202.000.
Thomas J. Lipton, Inc.: *See—*
Tresser, David, 4,560,563, Cl. 426-101.000.
Thomas, Philip D.; and Thomas, Harvel W. Stripper assembly for removing carpet. 4,560,146, Cl. 254-202.000.
Thompson, David: *See—*
Strecker, William D.; Buzynski, John E.; and Thompson, David, 4,560,985, Cl. 340-825.500.
Thompson, Gary J. Decorative light display. 4,561,043, Cl. 362-32.000.
Thompson, Jeffrey W.: *See—*
Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,560,728, Cl. 525-123.000.
Thompson, Thomas L., to Thom McI, Inc. Fiber-cement deck structure. 4,559,894, Cl. 114-45.000.
Thomsen, Peter: *See—*
Morner, Bengt; Vollertsen, Otto; and Thomsen, Peter, 4,560,040, Cl. 188-77.00R.
Thomson CSF: *See—*
Chanrion, Jean C., 4,560,960, Cl. 331-178.000.
Douziech, Patrick; and Imbert, Michel, 4,561,014, Cl. 358-25.000.
Gerard, Jean-Louis; Berthet, Pierre; Bricot, Claude; and Audoin, Michel, 4,561,082, Cl. 369-45.000.
Papuchon, Michel; Arditty, Herve ; and Puech, Claude, 4,560,867, Cl. 250-225.000.
Pinsard, Herve ; Collin, Claude; and Faydit, Joel, 4,561,101, Cl. 375-108.000.
Thoratec Laboratories Corporation: *See—*
Affeld, Klaus; Mohnhaupt, Axel; and Jorn, Frank, 4,559,648, Cl. 623-3.000.
Thornquist, Steven C.: *See—*
Bukhman, Yefim; and Thornquist, Steven C., 4,560,436, Cl. 156-643.000.
Thuen, Judy: *See—*
Hinrichs, Richard J.; and Thuen, Judy, 4,559,810, Cl. 73-54.000.
Tieman, Charles H.: *See—*
Stoutamire, Donald W.; and Tieman, Charles H., 4,560,515, Cl. 260-465.00D.
Tihanyi, Jeno; and Stengl, Jens P., to Siemens Aktiengesellschaft. Field effect transistor. 4,561,003, Cl. 357-23.400.
Tillich, Peter, to Olympia Werke AG. Method of typing scripts whose characters are arranged next to one another in rows or underneath one another in columns. 4,560,980, Cl. 340-727.000.
Timmons, Gloria A.: *See—*
Timmons, John W.; and Timmons, Gloria A., 4,559,941, Cl. 128-207.180.
Timmons, John W.; and Timmons, Gloria A. Eyeglass frame and nasal cannula assembly. 4,559,941, Cl. 128-207.180.
Toagosei Chemical Industry Co., Ltd.: *See—*
Okazaki, Toshimasa; and Nakagawa, Shuta, 4,560,461, Cl. 204-252.000.
Tobler, Hans: *See—*
Hoegerle, Karl; and Tobler, Hans, 4,560,402, Cl. 71-092.000.
Toda, Tetsuo: *See—*
Nonaka, Toshihiko; and Toda, Tetsuo, 4,559,868, Cl. 98-2.080.
Tokuhara, Mitsuhiro; and Yamada, Yu, to Canon Kabushiki Kaisha. Variable magnification optical system. 4,560,242, Cl. 350-425.000.
Tokuhara, Mitsuhiro, to Canon Kabushiki Kaisha. Printer head and electrophotographic printer utilizing the same. 4,560,999, Cl. 346-160.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Fumio, Ohtomo, 4,560,271, Cl. 356-5.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Andow, Fumio; and Inagaki, Junichi, 4,561,120, Cl. 455-612.000.
Hayashi, Yasunori, 4,560,889, Cl. 307-290.000.
Ikegaki, Makoto; Nakanishi, Masayuki; Sato, Humiyuki; and Hashimoto, Tokuo, 4,560,900, Cl. 313-479.000.
Iwamoto, Akito; and Sekizawa, Hidekazu, 4,560,280, Cl. 356-375.000.
Maeda, Satoshi; and Iwai, Hiroshi, 4,560,421, Cl. 148-1.500.
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,560,890, Cl. 307-355.000.
Matsuda, Susumu, 4,561,065, Cl. 364-724.000.
Matsuo, Takeshi; and Suzuki, Yukio, 4,560,634, Cl. 430-84.000.
Minami, Yuji; Kamiyama, Hisashi; and Tomita, Toshihide, 4,560,501, Cl. 252-628.000.
Nishimura, Fuminobu, 4,560,268, Cl. 355-3.00R.
Oida, Yoshio, 4,560,888, Cl. 307-272.00A.
Ramamurti, Krishnamurti, 4,560,870, Cl. 250-237.00G.
Shinozaki, Toshiaki; and Mori, Ichiro, 4,560,278, Cl. 356-364.000.
Takamura, Yoshio; and Nakajima, Akira, 4,561,048, Cl. 363-60.000.
Tateno, Haruo, 4,561,052, Cl. 364-200.000.
Yonezawa, Toshio; and Aoyama, Masaharu, 4,561,009, Cl. 357-67.000.
Tolle, Hans; Frech, Karl; and Ludke, Hartmut, to Carl Kurt Walther GmbH & Co. KG; and Theodor Heimeier Metallwerk GmbH. Process of deburring moldings made from granular material. 4,560,586, Cl. 427-134.000.
Tomita, Toshihide: *See—*
Minami, Yuji; Kamiyama, Hisashi; and Tomita, Toshihide, 4,560,501, Cl. 252-628.000.
Tomizu, Motoyuki: *See—*
Nishi, Hiroyuki; Hayashi, Mitsuji; and Tomizu, Motoyuki, 4,561,045, Cl. 362-368.000.
Toncelli, Marcello; and Cado', Walter, to Breton S.p.A. Blade-carrying frame for machines for cutting marble, granite and hard stone. 4,559,920, Cl. 125-17.000.
Toray Industries, Incorporated: *See—*
Naka, Yasushi; and Kawakami, Kiyoshi, 4,560,611, Cl. 428-266.000.
Toray Silicone Company, Ltd.: *See—*
Suzuki, Toshio, 4,560,711, Cl. 523-212.000.
Torftech Limited: *See—*
Dodson, Christopher E., 4,559,719, Cl. 34-10.000.
Torigoe, Taisuke: *See—*
Fujiwara, Mitsuru; and Torigoe, Taisuke, 4,560,333, Cl. 418-180.000.
Toriuchi, Masaharu; and Ono, Shigetoshi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,560,645, Cl. 430-562.000.
Toscano, Luciano: *See—*
Cappelletti, Leonardo M.; Spagnoli, Roberto; and Toscano, Luciano, 4,560,662, Cl. 435-253.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Motomura, Noriyuki; Tsuboi, Hiroyuki; and Yamada, Sadayoshi, 4,559,991, Cl. 164-457.000.
Totani, Tetsushi; Aono, Katsutoshi; and Komura, Michihiro, to Shionogi & Co., Ltd. Glycolic acid platinum complexes. 4,560,781, Cl. 556-137.000.
Totsuka, Mikio: *See—*
Maeda, Minoru; Inoue, Noriyuki; and Totsuka, Mikio, 4,560,637, Cl. 430-202.000.
Touchais, Thierry: *See—*
Franckx, Joris R. I.; Mendes, Luiz N.; van Noten, Lodewijk; and Touchais, Thierry, 4,560,828, Cl. 174-71.00R.
Tourneur, Roger, to Societe Anonyme D.B.A. Disc brake. 4,560,036, Cl. 188-73.320.
Town, Michael-Harold: *See—*
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.
Toyama, Hiroshige; Mizuno, Yoshiyuki; Yamamoto, Yoshimi; and Kato, Mitsuru, to Fuji Kiko Company, Limited. Emergency lock safety belt retractor with lock-up release mechanism. 4,560,115, Cl. 242-107.40A.
Toyama, Shozo; and Yatabe, Fumio, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine equipped with exhaust gas recirculation system. 4,559,917, Cl. 123-571.000.
Toyamasanki Co. Ltd.: *See—*
Sato, Takeshi, 4,560,434, Cl. 156-474.000.
Toyko Shibaura Electric Co., Ltd.: *See—*
Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, 4,560,642, Cl. 430-313.000.
Toyo Seikan Kaisha, Limited: *See—*
Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, 4,560,430, Cl. 156-285.000.
Toyo Soda Manufacturing Co. Ltd.: *See—*
Tsuzuki, Kenji; and Morinaka, Hideo, 4,560,762, Cl. 546-297.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Hayashi, Takehiko; Ikuta, Hiroyuki; and Shindo, Toshiki, 4,559,798, Cl. 72-81.000.
Toyokawa, Yasufumi: *See—*
Motojima, Kenji; Miyazawa, Takeshige; Toyokawa, Yasufumi; Matsuzawa, Masafumi; Hokari, Hiroshi; and Kusano, Shoji, 4,560,403, Cl. 71-106.000.
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, to Sanwa Kagaku Kenkyusho Co. Ltd.; and Shin-Etsu Chemical Co. Ltd. Organosilicon compounds and antitumor agents containing the compound as effective component. 4,560,679, Cl. 514-63.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Naganawa, Tadahisa; and Matsuda, Yoshihiko, 4,559,915, Cl. 123-406.000.
Onitsuka, Masaaki; and Fujiwara, Kazuyuki, 4,560,186, Cl. 280-752.000.
Yoshitsugu, Noritada, 4,560,187, Cl. 280-804.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, 4,560,332, Cl. 418-83.000.
Toyota, Shigekata: *See—*
Satake, Mitsuo; and Toyota, Shigekata, 4,561,084, Cl. 369-75.200.
Tracy, Richard J. Stretchable tie-down device. 4,559,677, Cl. 24-300.000.
Trail, Melvin P.: *See—*
Davis, Clint A.; and Trail, Melvin P., 4,561,059, Cl. 364-477.000.

Tremillon, Bernard: *See—*
Picard, Gerard; Flament, Thierry; Tremillon, Bernard; Saint-Paul, Pierre; and Spiteri, Pierre, 4,559,993, Cl. 165-1.000.

Tresser, David, to Thomas J. Lipton, Inc. Composite ice confections and processes for preparing them. 4,560,563, Cl. 426-101.000.

Trio Kabushiki Kaisha: *See—*
Naito, Michinori, 4,561,113, Cl. 455-205.000.

Trube, Hans: *See—*
Bauer, Kurt; Edele, Reinhard; Epple, Anton; Trube, Hans; Pfeiffer, Martin; and Berger, Josef, 4,559,663, Cl. 15-250.350.

Trumball, Douglas, to Showscan Film Corporation. Motion picture system. 4,560,260, Cl. 352-40.000.

TRW Inc.: *See—*
Danico, Henry F., 4,560,083, Cl. 220-307.000.
Deller, David L., 4,560,308, Cl. 407-53.000.
Dennis, Alan J., 4,560,226, Cl. 339-99.00R.

Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., to Wagner Spray Tech Corporation. Paint scraper. 4,559,661, Cl. 15-93.00R.

Tsang, Chin-Fu; and Doughty, Christine A., to United States of America, Energy. Thermal well-test method. 4,559,818, Cl. 73-154.000.

Tsaur, Shyh-Chang: *See—*
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, 4,561,004, Cl. 357-23.500.

Tsipis, Constantinos A.: *See—*
Papageorgiou, Vassilios P.; Bakola-Christianopoulou, Maria; and Tsipis, Constantinos A., 4,560,782, Cl. 556-137.000.

Tsuboi, Hiroyuki: *See—*
Motomura, Noriyuki; Tsuboi, Hiroyuki; and Yamada, Sadayoshi, 4,559,991, Cl. 164-457.000.

Tsuchiyama, Tadashi; and Hidaka, Yoshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Crankshaft bearing device for internal combustion engine. 4,559,910, Cl. 123-195.00R.

Tsujimoto, Michihiro; Asano, Makoto; Hasegawa, Kiyoharu; and Akahori, Hiroyuki, to Mitsui Toatsu Chemicals, Inc. Heat-sensitive recording unit. 4,561,000, Cl. 346-208.000.

Tsukahara, Michiyoshi, to Alps Electric Co., Ltd. Thick film electronic circuit. 4,561,039, Cl. 361-328.000.

Tsukamoto, Kazuyoshi; and Sakoguchi, Etsuo, to Sanyo Electric Co., Ltd. Single-ended push-pull induction heating apparatus. 4,560,851, Cl. 219-10.770.

Tsukiji, Yasuhiko: *See—*
Yanagisawa, Yasuhisa; and Tsukiji, Yasuhiko, 4,560,026, Cl. 180-287.000.

Tsukitani, Yasumasa: *See—*
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.

Tsunekawa, Tokuichi: *See—*
Kinoshita, Takao; Kawabata, Takashi; Hosoe, Kazuya; Tsunekawa, Tokuichi; and Sakane, Toshio, 4,560,864, Cl. 250-201.000.

Tsunoi, Makato; Kai, Toshio; Shozen, Daisaku; Morimoto, Tatsuo; Inoue, Ikuo; Jindo, Katsuo; and Sato, Tetsuya, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of manufacturing a combustor nozzle. 4,559,687, Cl. 29-157.00C.

Tsuzuki, Kenji; and Morinaka, Hideo, to Toyo Soda Manufacturing Co. Ltd. 2-Alkylaminopyridine derivatives. 4,560,762, Cl. 546-297.000.

Tsuzuki, Mitsuo, to NEC Corporation. Ink-jet recording system capable of recording a half-tone. 4,561,025, Cl. 358-298.000.

Tuchiya, Yoshimasa; and Minami, Tatsuo, to Nissan Motor Company, Limited. Slider assembly for automotive sliding door. 4,559,740, Cl. 49-216.000.

Tupper, Alan W., to Latchways Limited. Threading device. 4,560,098, Cl. 226-92.000.

Turner, Jeffrey A. Computer desk. 4,560,215, Cl. 312-196.000.

Turner, Jonathan S., to AT&T Bell Laboratories. Integrated self-checking packet switch node. 4,561,090, Cl. 370-60.000.

Tyrell, John A., to General Electric Company. Stabilized (poly)ester/-(poly)carbonate blend. 4,560,722, Cl. 524-405.000.

Uchibaba, Kouichi; Takahashi, Hirotake; and Uchiyama, Chiyomitsu, to Honda Giken Kogyo Kabushiki Kaisha. Operation device for clutch master cylinder with means to adjust the play stroke of the clutch lever. 4,560,049, Cl. 192-85.00R.

Uchida, Kazu: *See—*
Katano, Hiroki; Nishida, Hisato; Semba, Katsumi; Enomoto, Kouji; and Uchida, Kazu, 4,560,198, Cl. 296-185.000.

Uchida, Yasumi: *See—*
Nagano, Hiroyuki; Takagi, Mitiro; Kubodera, Noboru; Matsunaga, Isao; Nabata, Hiroyuki; Ohba, Yasuhiro; Sakai, Kazushige; Hata, Shun-ichi; and Uchida, Yasumi, 4,560,686, Cl. 514-255.000.

Uchikawa, Naoshi: *See—*
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; and Kotani, Sumihisa, 4,560,330, Cl. 418-55.000.

Uchitelle, Benjamin. Self-opening portable swimming enclosure and method of using same. 4,559,652, Cl. 4-487.000.

Uchiyama, Chiyomitsu: *See—*
Uchibaba, Kouichi; Takahashi, Hirotake; and Uchiyama, Chiyomitsu, 4,560,049, Cl. 192-85.00R.

Udaka, Shigezo; Miyashiro, Shigeyoshi; Hirayama, Kazuo; Ando, Toshihiko; Murai, Asao; Shiio, Tsuyoshi; Kida, Takao; and Shibai, Hiroshiro, to Ajinomoto Company Incorporated. Streptothricin-group compounds. 4,560,748, Cl. 536-24.000.

Ueda, Hiroshi; Yoshizaki, Akira; and Masaki, Yasuo, to Minolta Camera Kabushiki Kaisha. Flat camera with self photograph framing mirror. 4,560,261, Cl. 354-121.000.

Ueda, Yasuo: *See—*
Kagitani, Yoshio; Tanaka, Kenji; Ueda, Yasuo; Shiraga, Yusei; Nakajima, Tunetaka; Doi, Takuji; Ohmura, Takao; Funakoshi, Satoshi; and Suyama, Tadakazu, 4,560,556, Cl. 424-101.000.

Ueeda, Ryuhei; Fujii, Kiyonobu; Kubotsu, Akira; Kaneda, Shunji; and Okuno, Kenji, to Kuraray Co., Ltd. Mica flake mass and resin composition with the same incorporated therein. 4,560,715, Cl. 523-443.000.

Uematsu, Tadayuki: *See—*
Hane, Yoshinari; Suzuki, Hiroshi; Uematsu, Tadayuki; Matsumoto, Shigeru; Momma, Tetuo; Kamiya, Akihiko; and Saito, Mitugu, 4,559,973, Cl. 138-138.000.

Uemura, Masahito: *See—*
Tanahashi, Takashi; Takai, Mitsuo; and Uemura, Masahito, 4,559,651, Cl. 4-443.000.

Ueno, Katsuji; Sugimoto, Hiroaki; and Hayatsu, Kazuo, to Sumitomo Chemical Company, Limited. Method for producing aromatic polyesters. 4,560,740, Cl. 528-125.000.

Ueno, Sadayasu: *See—*
Sato, Kanemasa; and Ueno, Sadayasu, 4,559,814, Cl. 73-118.000.

Ueno, Shoji: *See—*
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.

Ueno, Susumu; and Nomura, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Method for improving surface properties of a shaped article of a synthetic resin. 4,560,458, Cl. 204-165.000.

Uggeri, Fulvio: *See—*
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,560,777, Cl. 549-374.000.

Ulmer, Harrold, to Whittar Industries, Ltd. Shopping cart. 4,560,180, Cl. 280-33.99B.

Ulming, Lennart E., to Telefonaktiebolaget LM Ericsson. Safety device for venting excess pressure in wet capacitor containers. 4,559,969, Cl. 137-540.000.

Unger, Manfred: *See—*
Moraw, Roland; Unger, Manfred; and Walter, Helmut, 4,560,426, Cl. 156-64.000.

Unger, Stefan H.: *See—*
Muchowski, Joseph M.; and Unger, Stefan H., 4,560,699, Cl. 514-413.000.

Union Carbide Corporation: *See—*
Alberto, Vicente S. D., 4,560,632, Cl. 429-196.000.
Beddome, Robert A.; and Cheung, Harry, 4,560,398, Cl. 62-29.000.
Burns, Richard J.; Willeboordse, Friso G.; and Cohen, Martin F., 4,560,410, Cl. 106-2.000.
Cheung, Harry, 4,560,397, Cl. 62-28.000.
Collier, Joseph A., 4,560,813, Cl. 568-872.000.
Crowley, Harris L., Jr.; and Coyle, Everett T., Jr., 4,561,041, Cl. 361-433.000.
Gross, Laurence H.; and Noshay, Allen, 4,560,671, Cl. 502-105.000.
Kamp, Ewald A., 4,561,108, Cl. 383-63.000.
Nielsen, Kenneth A., 4,560,451, Cl. 204-79.000.
Rifi, Mahmoud R., 4,560,731, Cl. 525-344.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Banbury, John R., 4,560,233, Cl. 350-3.700.
Lewis, Keith L.; and Savage, James A., 4,560,576, Cl. 427-38.000.

United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Pater, Ruth H., 4,560,742, Cl. 528-342.000.
Agriculture: *See—*
Rosen, Howard N.; Kent, Albert C.; and Girod, George F., 4,559,823, Cl. 73-338.000.
Air Force: *See—*
Berthel, Robert O.; Plank, Vernon G.; and LaGross, Dennis L., 4,561,018, Cl. 358-107.000.
Guimont, John M.; Manser, Gerald E.; and Ross, Donald L., 4,560,779, Cl. 549-510.000.
Army: *See—*
Crawford, James I.; and Howell, W. Max, 4,560,120, Cl. 244-3.220.
Pistor, Helmut H., 4,560,220, Cl. 339-74.00R.
Salomon, Mark; and Plichta, Edward J., 4,560,630, Cl. 429-194.000.
Walker, Charles W., Jr.; Wade, William L., Jr.; Binder, Michael; and Gilman, Sol, 4,560,628, Cl. 429-105.000.
Commerce: *See—*
Scire, Fredric E.; and Teague, E. Clayton, 4,559,717, Cl. 33-568.000.
Energy: *See—*
Batzer, Thomas H.; and Call, Wayne R., 4,559,787, Cl. 62-55.500.
Colburn, Richard P., 4,560,529, Cl. 376-251.000.
Hudgens, Claude R., 4,560,897, Cl. 313-337.000.
Huebotter, Paul R.; and McLennan, George A., 4,560,533, Cl. 376-367.000.
Joy, Richard W., 4,560,626, Cl. 429-27.000.
Kupperman, David S.; and Lanham, Ronald N., 4,559,827, Cl. 73-644.000.
Landingham, Richard L., 4,560,621, Cl. 428-566.000.
Maschke, Alfred W., 4,560,905, Cl. 315-5.410.
McCarty, Kevin F.; and Schrader, Glenn L., 4,560,470, Cl. 208-215.000.
Migliori, Albert; and Swift, Gregory W., 4,560,849, Cl. 219-10.510.

Tsang, Chin-Fu; and Doughty, Christine A., 4,559,818, Cl. 73-154.000.
Wilhelm, William G., 4,559,924, Cl. 126-426.000.
National Aeronautics and Space Administration: *See*—
Mirtich, Michael J.; Sovey, James S.; and Banks, Bruce A., 4,560,577, Cl. 427-38.000.
Navy: *See*—
Bender, Roland, 4,560,228, Cl. 339-147.00R.
U.S. Philips Corporation: *See*—
Baker, Ian M., 4,559,695, Cl. 29-572.000.
Bourgonje, Wouter, 4,560,835, Cl. 179-16.0AA.
Janssen, Peter J. M.; and van Rosmalen, Gerard E., 4,561,081, Cl. 369-45.000.
Janta, Dieter; and Nolde, Wolfgang, 4,560,942, Cl. 329-101.000.
Kindler, Ulrich, 4,561,068, Cl. 364-825.000.
Knapp, Alan G.; and Mansell, John R., 4,560,898, Cl. 313-400.000.
Nakayama, Mitsuhisa, 4,561,078, Cl. 369-38.000.
Ridder, Wouterus, 4,561,112, Cl. 455-166.000.
Schijven, Lucas W. M., 4,561,030, Cl. 360-93.000.
Shannon, John M., 4,561,005, Cl. 357-24.000.
Sharpe, Robin, 4,560,963, Cl. 333-172.000.
Sneijers, Andreas P. E.; Claassens, Jacobus M. M.; and Van den Plas, Roger J. Q., 4,560,903, Cl. 313-625.000.
Thillays, Jacques C., 4,560,901, Cl. 313-499.000.
van de Griend, Jan M., 4,560,893, Cl. 310-43.000.
van den Enden, Adrianus W. M.; and van Mil, Job F. P., 4,560,836, Cl. 179-18.0BC.
van Tol, Nicolaas, 4,561,098, Cl. 375-49.000.
U.S. Product Development Co.: *See*—
Adell, Robert, 4,559,741, Cl. 49-462.000.
United Technologies Corporation: *See*—
Gagnon, Ronald W., 4,560,968, Cl. 335-281.000.
Poumakis, Demetrius, 4,560,938, Cl. 328-71.000.
Universal House: *See*—
Young, David E.; and Boyes, David H., 4,559,935, Cl. 128-88.000.
Universal Instruments Corporation: *See*—
Henninger, Albert S., 4,560,584, Cl. 427-96.000.
Universal Maschnei.fabrik Dr. Rudolf Schieber GmbH & Co., KG: *See*—
Schimko, Reinhold; and Paul, Werner, 4,559,791, Cl. 66-75.100.
University of California, Regents of the: *See*—
Barbaric, Zoran L.; and Nelson, Robert S., 4,560,882, Cl. 250-487.100.
Jenkins, Scott A.; and Sparks, Joseph B., 4,560,304, Cl. 405-74.000.
University of South Carolina: *See*—
Davis, Milton W., Jr., 4,560,816, Cl. 585-266.000.
University Patents, Inc.: *See*—
Wilson, Stephen R.; Orme-Johnson, W.; and Nagahisa, A., 4,560,557, Cl. 514-178.000.
Unmuth, Eugene E.: *See*—
Hopkins, P. Donald; Nevitt, Thomas D.; and Unmuth, Eugene E., 4,560,469, Cl. 209-110.000.
Unno, Ryoichi: *See*—
Toyoshima, Shigeshi; Kurono, Masayasu; Unno, Ryoichi; and Ito, Koichi, 4,560,679, Cl. 514-63.000.
UOP Inc.: *See*—
Arnold, Edward C., 4,560,504, Cl. 260-112.00B.
Cleary, Michael T.; and Laughlin, William C., 4,560,675, Cl. 502-407.000.
Polak, Anthony J.; and Beuhler, Allyson J., 4,560,444, Cl. 204-1.00T.
Upchurch, James M., to Schlumberger Technology Corporation. Pressure-activated well perforating apparatus. 4,560,000, Cl. 166-55.100.
Upjohn Company, The: *See*—
McCall, John M.; and Lahti, Robert A., 4,560,767, Cl. 548-578.000.
Ura, Mitsuru: *See*—
Ogihara, Satoru; Takeda, Yukio; Maeda, Kunihiro; Nakamura, Kousuke; and Ura, Mitsuru, 4,561,010, Cl. 357-74.000.
Urban, Paul L.: *See*—
Wilhelmson, Jack L.; and Urban, Paul L., 4,560,101, Cl. 228-54.000.
Urihara, Kazuhiro: *See*—
Kojo, Hidehiko; Akimoto, Koji; and Urihara, Kazuhiro, 4,560,732, Cl. 525-481.000.
Urrea, Peter D.; Doris, Geoffrey W.; and Newman, Stephen D. Hydrophilic lens tinting and coloring apparatus. 4,559,897, Cl. 118-406.000.
Ushikubo, Takashi: *See*—
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Lassiaz, Philippe, 4,560,053, Cl. 192-98.000.
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Renaud, Pierre, 4,560,052, Cl. 192-98.000.
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Vanni, Sergio; Guidi, Loris; Vallini, Paolo; Pace, Renato C.; and Scotti, Carlo, 4,560,384, Cl. 8-94.210.
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Van Becelaere, Robert M.; and Bailey, William J., to Philips Industrial Components, Inc. Round damper and fusible link therefor. 4,559,867, Cl. 98-1.000.
Van Bokhoven, Petrus H. M.; and Van Asperen, Pieter J., to Stamicarbon B.V., Licensing Subsidiary of DSM. Polymer composition based on a polycarbonate and a graft copolymer. 4,560,725, Cl. 525-67.000.
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Hoover, Merwin F.; Reilly, Phillip B.; Salamone, Ann B.; and Vandebult, Jan, 4,560,445, Cl. 204-15.000.
van de Griend, Jan M., to U.S. Philips Corporation. Electric motor. 4,560,893, Cl. 310-43.000.
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van der Stoel, Roland E.; Bosma, Marcel A. R.; Janssen, Petrus H. J.; and van de Moesdijk, Cornelis G. M., 4,560,760, Cl. 546-243.000.
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dePuglia, Gaston D.; Van der Borght, William J.; and Moitzger, Max, 4,560,138, Cl. 249-95.000.
van der Hoeven, Bernard J. C., Jr.: *See*—
Brown, Karen H.; Moore, David F.; and van der Hoeven, Bernard J. C., Jr., 4,560,435, Cl. 156-643.000.
van der Lely, Cornelis. Tracked vehicles having ground engaging profiles. 4,560,211, Cl. 305-35.0EB.
van der Schans, Albert, to Magnetic Peripherals Inc. Peak amplitude measurement. 4,560,940, Cl. 328-150.000.
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van Mil, Job F. P.: *See*—
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Franckx, Joris R. I.; Mendes, Luiz N.; van Noten, Lodewijk; and Touchais, Thierry, 4,560,828, Cl. 174-71.00R.
van Rosmalen, Gerard E.: *See*—
Janssen, Peter J. M.; and van Rosmalen, Gerard E., 4,561,081, Cl. 369-45.000.
Van Steenwyk, Brett H.: *See*—
Ott, Paul W.; Engebretson, Harold J.; LaHue, Philip M.; and Van Steenwyk, Brett H., 4,559,713, Cl. 33-302.000.
van Tol, Nicolaas, to U.S. Philips Corporation. Receiver for FFSK modulated data signals. 4,561,098, Cl. 375-49.000.
Varga, John M. J.: *See*—
Rimmer, Michael J.; and Varga, John M. J., 4,559,674, Cl. 19-102.000.
Varian Associates, Inc.: *See*—
Petric, Paul F.; Foley, Michael S.; Waz, John J.; and Milgate, Robert W., III, 4,560,880, Cl. 250-441.100.
Varian Techtron Pty Limited: *See*—
Sturman, Barry T., 4,559,808, Cl. 73-23.000.
Vaughan, Raymond C.; DiSabito, David M.; Mruk, Norbert J.; and Eddy, Arthur R., Jr., to Graphic Controls Corporation. Disposable biomedical and diagnostic electrode. 4,559,950, Cl. 128-641.000.
Veneziani, Carlo: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, 4,560,696, Cl. 514-397.000.
Vercon, Inc.: *See*—
Peterson, Bertel R.; and Fortuna, Vincent E., 4,560,064, Cl. 206-159.000.
Verdini, Antonio S.: *See*—
Pinori, Massimo; and Verdini, Antonio S., 4,560,505, Cl. 260-112.50R.
Verson Allsteel Press Company: *See*—
Budrean, John D.; and Kirkpatrick, John A., 4,559,802, Cl. 72-349.000.
Victor Company of Japan, Ltd.: *See*—
Abe, Ryozo; and Sakurai, Masaki, 4,561,026, Cl. 358-336.000.
Nishikawa, Kazunori; Iwasaki, Yoshiki; Masuda, Isao; Ueno, Shoji; Komura, Makoto; and Takahashi, Nobuaki, 4,561,083, Cl. 369-59.000.
Vider, Leslie, to Sivaco Quebec. Heat recuperator and method for use with gas-fired furnace using nozzle or pre-mix burners. 4,560,349, Cl. 432-223.000.

Vierling, Horst: *See*—
Hien, Rochus; Weigel, Wolfgang; and Vierling, Horst, 4,560,869, Cl. 250-235.000.

Villa, Giovanni: *See*—
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,560,777, Cl. 549-374.000.

Villani, Frank J., to Schering Corporation. Tricyclic antihistamines. 4,560,688, Cl. 514-243.000.

Vinatier, Bernard: *See*—
Ollivier, Jean-Paul; and Vinatier, Bernard, 4,560,613, Cl. 428-309.900.

Vinci, James N., to Lubrizol Corporation, The. Metal working using lubricants containing basic alkali metal salts. 4,560,488, Cl. 252-33.000.

Vingmed A/S Inkognitogt: *See*—
Angelsen, Bjorn A. J.; and Kristoffersen, Kjell, 4,559,952, Cl. 128-663.000.

Vinson, Kenneth D., to Kendall Company, The. Fluid collection bag with a screen for a surgical drape. 4,559,937, Cl. 128-132.00D.

Voest-Alpine Aktiengesellschaft: *See*—
Fohler, Johann, 4,560,314, Cl. 414-276.000.

Vogelhut, Paul O.: *See*—
Kung, Wei-jen; and Vogelhut, Paul O., 4,560,534, Cl. 422-68.000.

Vogt, George H.; and Derderian, Scott K., to General Electric Company. Composite slot insulation for dynamoelectric machine. 4,560,896, Cl. 310-215.000.

Vogt, Martin C.: *See*—
Kim, Tai K.; Munn, Robin W.; Boyer, Carl W.; and Vogt, Martin C., 4,560,539, Cl. 423-59.000.

Vogt, Wilhelm: *See*—
Zoche, Gunter; and Vogt, Wilhelm, 4,560,787, Cl. 560-52.000.

Volkert, Wynn A.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; and Crump, Druce K., 4,560,548, Cl. 424-1.100.

Vollertsen, Otto: *See*—
Morner, Bengt; Vollertsen, Otto; and Thomsen, Peter, 4,560,040, Cl. 188-77.00R.

Vollmer, Jurgen; and Herchenbach, Paul, to Jean Walterscheid GmbH. Disengageable coupling mechanism for a drive shaft assembly. 4,560,300, Cl. 403-11.000.

Volz, Wolfgang: *See*—
Grimm, Hermann; Volz, Wolfgang; Supper, Ottmar; and Pfeiffer, Martin, 4,560,973, Cl. 338-28.000.
Waldmann, Heinrich; Halder, Prasanta; Volz, Wolfgang; and Stolz, Albert, 4,559,994, Cl. 165-41.000.

Vom Hofe, Dieter; and Meyer, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Packaging container. 4,560,085, Cl. 220-465.000.

Vorbrueggen, Helmut: *See*—
Skuballa, Werner; Raduechel, Bernd; Schwarz, Norbert; Vorbrueggen, Helmut; Elger, Walter; Loge, Olaf; and Town, Michael-Harold, 4,560,786, Cl. 560-55.000.

Vxtra Corporation, 700 Division: *See*—
Williams, Rodger W.; Atwood, Charles W.; and Morgan, Lawrence J., 4,560,144, Cl. 251-344.000.

W. R. Grace & Co.: *See*—
Sherwin, Martin B.; and Blouin, John J., 4,560,653, Cl. 435-109.000.
Siadat, Bahram; and Morgan, Charles R., 4,560,579, Cl. 427-45.100.

W & T Avery Limited: *See*—
Hatton, John S.; Clarke, Roland N.; and Saini, Raj K., 4,561,038, Cl. 361-280.000.

Wacker-Chemie GmbH: *See*—
Brabetz, Hartmut; Eck, Herbert; Jira, Reinhard; and Hopf, Heinrich, 4,560,724, Cl. 524-734.000.

Wada, Katsuyasu: *See*—
Koh, Shiro; Wada, Katsuyasu; Namioka, Kazuhiko; and Hitomi, Masuo, 4,560,415, Cl. 106-286.300.

Wade, William L., Jr.: *See*—
Walker, Charles W., Jr.; Wade, William L., Jr.; Binder, Michael; and Gilman, Sol, 4,560,628, Cl. 429-105.000.

Wagner Spray Tech Corporation: *See*—
Tsals, Izrail; Peterson, Gerald E.; Karliner, Rudy R.; Carpenter, Scott R.; and Frank, Peter L., 4,559,661, Cl. 15-93.00R.

Waibel, Walter. Corner work table, in particular for office work. 4,559,877, Cl. 108-64.000.

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Walker, Charles W., Jr.; Wade, William L., Jr.; Binder, Michael; and Gilman, Sol, to United States of America, Army. High capacity inorganic oxyhalide electrochemical cell. 4,560,628, Cl. 429-105.000.

Wallbridge, William L.: *See*—
Hazenbroek, Jacobus E.; and Wallbridge, William L., 4,559,672, Cl. 17-11.000.

Wallez, Bernard: *See*—
Batard, Denis; Freland, Jean-Claude; Wallez, Bernard; Desffains, J. Paul; and Valle, Roger, 4,559,933, Cl. 128-78.000.

Wallgren, Hans A.: *See*—
Ahlen, Karl-Gustav; Bergstrom, Per-Olof; and Wallgren, Hans A., 4,559,849, Cl. 74-761.000.

Walling, Jorg-Hein; Arbuthnot, Gerald; and Shannon, Michael A., to Northern Telecom Limited. Maintaining homogeneity in a mixture. 4,560,521, Cl. 264-24.000.

Walsh, John P., to Ford Motor Company. Transmission control system for a transmission having input shafts clutched to a power source. 4,560,045, Cl. 192-3.580.

Waltec, Inc.: *See*—
Pruckner, Walter, 4,559,650, Cl. 4-420.000.

Walter, Helmut: *See*—
Moraw, Roland; Unger, Manfred; and Walter, Helmut, 4,560,426, Cl. 156-64.000.

Wang, Chen-Shih: *See*—
Abu-Isa, Ismat A.; Wang, Chen-Shih; McCarthy, Daniel P.; and Patterson, David W., 4,559,688, Cl. 29-157.30R.

Ward, Michael D.: *See*—
Harris, Jonathan H.; Tenhover, Michael A.; Grasselli, Robert K.; and Ward, Michael D., 4,560,454, Cl. 204-128.000.

Waring, John L.: *See*—
Sita, Richard K.; Orr, John R.; and Waring, John L., 4,561,027, Cl. 360-39.000.

Warmack, Ralph E., to Amoco Corporation. Computationally efficient weighting and vertical stacking methods and apparatus for improving the single-to-noise ratio of seismic data. 4,561,074, Cl. 367-46.000.

Warning, Theodore J.; and Cairo, John A., Jr. Process and apparatus for filtration of oil and gas well fluids. 4,560,483, Cl. 210-777.000.

Washington, Richard J. Snare device. 4,559,737, Cl. 43-59.000.

Waste Recovery, Inc.: *See*—
Rouse, Michael W.; and Thelen, Robert L., 4,560,112, Cl. 241-236.000.

Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, to Toyo Seikan Kaisha, Limited. Method of making a metallic container. 4,560,430, Cl. 156-285.000.

Watanabe, Namio, to Akebono Brake Industry Co., Ltd. Disc brake. 4,560,035, Cl. 188-72.800.

Watanabe, Noboru; and Kubo, Yoichiro, to Nippon Zeon Co. Ltd. Rubber composition. 4,560,729, Cl. 525-233.000.

Watanabe, Sharkey. Citrus fruit processing and food product. 4,560,572, Cl. 426-616.000.

Watanabe, Yoshitaka: *See*—
Sato, Yuichi; Sakurada, Nobuaki; Kawamura, Hideaki; and Watanabe, Yoshitaka, 4,560,997, Cl. 346-140.00R.

Watatani, Seiji: *See*—
Akahane, Naoto; Yamaguchi, Yoshitake; Matsuura, Takeshi; and Watatani, Seiji, 4,561,034, Cl. 360-134.000.

Water Jet Corporation: *See*—
Meisenheimer, William L., 4,560,838, Cl. 179-81.00R.

Wavin B.V.: *See*—
Herder, Kornelis, 4,561,107, Cl. 383-37.000.

Way, James, to Nitrotec Corporation. Method of and arrangement for enriching the nitrogen content of an effluent gas in a pressure swing adsorption system. 4,560,393, Cl. 55-5.000.

Waz, John J.: *See*—
Petric, Paul F.; Foley, Michael S.; Waz, John J.; and Milgate, Robert W., III, 4,560,880, Cl. 250-441.100.

Weaver, Frank C., to Stewart-Warner Corporation. Vehicle speed sensor. 4,560,365, Cl. 464-52.000.

Webb, Kenneth L., Jr., to Schnadig Corporation. Blind tacks for upholstered furniture. 4,559,683, Cl. 29-91.100.

Webb, Paul P., to RCA Inc. Double mesa avalanche photodetector. 4,561,007, Cl. 357-30.000.

Webb, Terence C.: *See*—
Long, William E.; Smith, Norman A.; Webb, Terence C.; Postle, Stephen R.; McCombe, Kenneth M.; and Grossel, Martin C., 4,560,646, Cl. 430-566.000.

Weber, Charles M.: *See*—
Domian, Henry A.; and Weber, Charles M., 4,560,854, Cl. 219-121.0EW.

Weber, Jens; and Czempiel, Ernst-Michael, to Krone GmbH. Method and apparatus for signaling an existing telephone communication between picture telephone apparatuses. 4,560,833, Cl. 179-2.0TV.

Weber, John A.; and Henze, Herbert O., to Penn Fishing Tackle Mfg. Co. Drive mechanism for fishing reel. 4,560,118, Cl. 242-215.000.

Weber, Paul, to Krupp Polysius AG. White cement production. 4,560,412, Cl. 106-101.000.

Weberndoerfer, Volkmar; Brunnmueller, Friedrich; Eisert, Manfred; and Bermes, Rudolf, to BASF Aktiengesellschaft. Preparation of dyes which contain sulfonic acid groups and have a low electrolyte content. 4,560,745, Cl. 534-728.000.

Wegh, John R.: *See*—
Bolenbaugh, Daniel L.; Wegh, John R.; and Smith, Roger L., 4,560,039, Cl. 188-73.450.

Weglin, Walter. Drafting machine. 4,559,715, Cl. 33-438.000.

Wehner, Hans-Joachim; and Burkhardt, Wolfgang, to Pforzheimer Uhren-Rohwerke PORTA GmbH & Co. Instrument illuminating arrangement. 4,561,042, Cl. 362-30.000.

Weichel, Ernst. Soil layer cultivator with a pressure roller unit. 4,560,010, Cl. 172-177.000.

Weigel, Wolfgang: *See*—
Hien, Rochus; Weigel, Wolfgang; and Vierling, Horst, 4,560,869, Cl. 250-235.000.

Weil, Edward D.: *See*—
Telschow, Jeffrey E.; and Weil, Edward D., 4,560,772, Cl. 549-240.000.

Weiland, Mary C. Medical accessory. 4,560,378, Cl. 604-83.000.

Weiland, Richard H.: *See*—
Sealey, Francis; and Weiland, Richard H., 4,560,123, Cl. 244-129.500.

Weisenberger, Johannes: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.

Weisenburger, Lawrence P., to AMP Incorporated. Flat cable termination. 4,560,224, Cl. 339-97.00C.

Weiss, Myron: *See—*
Patty, Charles W.; and Weiss, Myron, 4,559,861, Cl. 84-470.00R.

Weldex, Inc.: *See—*
Reynolds, Roger G., 4,560,852, Cl. 219-113.000.

Weller, Harold N., III; Gordon, Eric M.; and Delaney, Norma G., to E. R. Squibb & Sons, Inc. Mercaptocycloalkylcarbonyl and mercaptoarylcarbonyl dipeptides. 4,560,506, Cl. 260-112.50R.

Welles, Kenneth B., II; and Noujaim, Sharbel E., to General Electric Company. Frequency modulation detector using digital signal vector processing. 4,560,941, Cl. 329-50.000.

Wen Products, Inc.: *See—*
Soultanian, Setrak D., 4,560,915, Cl. 320-35.000.

Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co.: *See—*
Eckstein, Rolf; and Dechert, Ralf, 4,560,310, Cl. 409-233.000.

Werner, Ernest A., to J. H. Sessions & Son. Fastening assembly. 4,560,190, Cl. 292-111.000.

West, Michael D., to International Telephone and Telegraph Corporation. Zone control valve. 4,560,140, Cl. 251-11.000.

Westfalia Separator AG: *See—*
Wucherpfennig, Karl; Bott, Ernst W.; and Schottler, Peter, 4,560,565, Cl. 426-330.400.

Westinghouse Brake & Signal Co. Ltd.: *See—*
Negus, Paul D.; Ng, Tak C.; Badge, Roger; and Cowen, David W., 4,560,943, Cl. 329-103.000.

Westinghouse Electric Corp.: *See—*
Barry, Robert F.; Delzell, Susan C.; Wilson, John F.; and Nylund, Theodore W., 4,560,532, Cl. 376-434.000.
Eisenstatt, Larry R.; and Radford, Kenneth C., 4,560,575, Cl. 427-6.000.
Gyugyi, Laszlo, 4,560,917, Cl. 323-210.000.
Hall, Richard L., 4,560,100, Cl. 228-40.000.
Miller, Richard A.; and Bucher, George D., 4,560,856, Cl. 219-121.0LC.
Olver, Terence E., 4,560,945, Cl. 330-149.000.
Owen, Timothy C.; and Witzigman, Charles J., 4,559,699, Cl. 29-602.00R.
Pelowski, Kenneth R., 4,560,936, Cl. 324-418.000.
Radford, Kenneth C.; Keller, Herbert W.; Parks, Beryl H.; and Fuller, Robert R., 4,560,462, Cl. 204-298.000.

Westvaco Corporation: *See—*
Klein, Edward P.; and Neider, Thomas M., 4,560,440, Cl. 162-263.000.

Wexler, Jonathan B., to Fire Research Pty. Limited. Devices for the fire stopping of plastics pipes. 4,559,745, Cl. 52-1.000.

Weyl, Helmut: *See—*
Frey, Thomas; Grunwald, Werner; Knoll, Gunther; and Weyl, Helmut, 4,560,463, Cl. 204-424.000.

WGM Safety Corp.: *See—*
Dalmaso, George C., 4,560,029, Cl. 182-5.000.

Wheeler, Douglas J.: *See—*
Sane, Ajit Y.; Wheeler, Douglas J.; and Kuivila, Charles S., 4,560,448, Cl. 204-67.000.

Wheeless, Kenneth L.: *See—*
Willeby, Randy C.; and Wheeless, Kenneth L., 4,560,128, Cl. 248-230.000.

White, Roger B., to Continental Group, Inc., The. Container having prize indicia on the interior thereof. 4,559,729, Cl. 40-306.000.

Whitehead, Larry W., to Leggett & Platt, Incorporated. Sheet metal bedrail. 4,559,657, Cl. 5-286.000.

Whiting, Dennis W.: *See—*
Smith, Maurice D., 4,559,906, Cl. 119-96.000.

Whittar Industries, Ltd.: *See—*
Ulmer, Harrold, 4,560,180, Cl. 280-33.99B.

Whittecar, William C. Wave power energizer. 4,560,884, Cl. 290-42.000.

Whittle, Peter J.: *See—*
Richardson, Kenneth; and Whittle, Peter J., 4,560,697, Cl. 514-383.000.

Wiaux, Jean-Pol: *See—*
Nguyen, Thinh; Wiaux, Jean-Pol; and Vance, Christopher J., 4,560,446, Cl. 204-58.500.

Wickersheim, Kenneth A., to Luxtron Corporation. Optical temperature measurement techniques utilizing phosphors. 4,560,286, Cl. 374-131.000.

Widmer, Stanley W. Air bag jack. 4,560,145, Cl. 254-93.0HP.

Wiegers, Wilhelmus J., to International Flavors & Fragrances Inc. Norbornylbutadiene-acrolein adducts, process for preparing same and perfumery uses thereof. 4,560,500, Cl. 252-522.00R.

Wieland, Erwin H.; and Haug, Walter, to Karl Kassbohrer Fahrzeugwerke GmbH. Rotary tiller for maintaining cross country ski trails. 4,559,725, Cl. 37-197.000.

Wietelmann, Jurgen: *See—*
Flaig, Ulrich; Grieshaber, Hermann; Sieber, Albrecht; and Wietelmann, Jurgen, 4,559,914, Cl. 123-359.000.

Wigger, Andreas: *See—*
Jung, Eggert; Roes, Christian; Wigger, Andreas; and Ziemen, Ernst-August, 4,561,016, Cl. 358-76.000.

Wiklund, David E.: *See—*
Burlage, Brian J.; Wiklund, David E.; and Lenz, Gary A., 4,559,832, Cl. 73-861.240.

Wiklund, Klas R.; and Hertzman, Mikael, to Geotronics AB. Device included in a distance meter system. 4,560,270, Cl. 356-5.000.

Wilcoski, Thomas M.: *See—*
DeKarske, Clarence W.; and Wilcoski, Thomas M., 4,560,939, Cl. 328-72.000.

Wilder, Leslie N. Stand for display devices. 4,560,132, Cl. 248-396.000.

Wilhelm, William G., to United States of America, Energy. Thin film absorber for a solar collector. 4,559,924, Cl. 126-426.000.

Wilhelmson, Jack L.; and Urban, Paul L., to Cooper Industries, Inc. Self-locking, removeable tapered tips for soldering and de-soldering tools. 4,560,101, Cl. 228-54.000.

Wilhelmsson, Per H., to Santrade Limited. Method of using chromium-nickel-manganese-iron alloy with austenitic structure in sulphurous environment at high temperature. 4,560,408, Cl. 75-128.00A.

Willeboordse, Friso G.: *See—*
Burns, Richard J.; Willeboordse, Friso G.; and Cohen, Martin F., 4,560,410, Cl. 106-2.000.

Willeby, Randy C.; and Wheeless, Kenneth L. Drink holder. 4,560,128, Cl. 248-230.000.

Williams, Arthur C.: *See—*
Judkins, Milton W.; and Williams, Arthur C., 4,560,126, Cl. 248-72.000.

Williams, Marshall, to Ampex Corporation. Dynamically interactive responsive control device and system. 4,560,983, Cl. 340-825.000.

Williams, Rodger W.; Atwood, Charles W.; and Morgan, Lawrence J., to Vxtra Corporation, 700 Division. Fluid coupling device. 4,560,144, Cl. 251-344.000.

Williams, Ronald E. Remote actuator for metal detector discriminating adjust switch. 4,560,935, Cl. 324-326.000.

Williams, Thomas M., Jr. Trailer hitch. 4,560,184, Cl. 280-478.00B.

Willigman, John: *See—*
Klopp, Jerome C.; and Willigman, John, 4,560,846, Cl. 200-38.00R.

Willis, Brian J.: *See—*
Farbood, Mohamad I.; and Willis, Brian J., 4,560,656, Cl. 435-146.000.

Wilson, Angele; and Wilson, John, to Direct Broadcast Programs Inc. Watch and play activity kit. 4,560,359, Cl. 446-75.000.

Wilson, Bruce E.: *See—*
De Boynton, William L.; Lee, Frederick C.; Wilson, Bruce E.; and O'Rourke, John F., 4,559,711, Cl. 33-199.00R.

Wilson, David A.: *See—*
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; and Crump, Druce K., 4,560,548, Cl. 424-1.100.

Wilson, James S.: *See—*
Rokos, George H. S.; and Wilson, James S., 4,560,959, Cl. 331-176.000.

Wilson, John: *See—*
Wilson, Angele; and Wilson, John, 4,560,359, Cl. 446-75.000.

Wilson, John F.: *See—*
Barry, Robert F.; Delzell, Susan C.; Wilson, John F.; and Nylund, Theodore W., 4,560,532, Cl. 376-434.000.

Wilson, Lionel A., to Xerox Corporation. Bottom sheet separator-feeder. 4,560,158, Cl. 271-165.000.

Wilson Sporting Goods Co.: *See—*
Aoyama, Steven, 4,560,168, Cl. 273-232.000.

Wilson, Stephen R.; Orme-Johnson, W.; and Nagahisa, A., to University Patents, Inc. Silicon and sulfur steroids as irreversible inhibitors of hormone biosynthesis. 4,560,557, Cl. 514-178.000.

Wilson, Wilfred W.; and Schlanger, Albert. Door securer. 4,560,192, Cl. 292-339.000.

Wimmer, Guenther W., to Tektronix, Inc. Low voltage transformer coupled ink jet driver. 4,560,998, Cl. 346-140.00R.

Windish, Willis E.; and Schneider, Marvin L., to Caterpillar Tractor Co. Annular multi-piston brake apparatus. 4,560,034, Cl. 188-72.300.

Wingerter, Franz, to Heinrich H. Klussendorf GmbH & Co. KG. Apparatus for storing flat and preferably circular objects. 4,559,958, Cl. 133-4.00A.

Winkler & Dunnebier Maschenfabrik und Eigengiesserei GmbH & Co. KG: *See—*
Stemmler, Kurt, 4,560,379, Cl. 604-368.000.

Winslow, Donald W.; and Wray, Gary Q., to Halliburton Company. Drill pipe tester - pressure balanced. 4,560,004, Cl. 166-321.000.

Winter, Mark A.: *See—*
Hirsch, Kenneth S.; Jones, Charles D.; Taylor, Harold M.; and Winter, Mark A., 4,560,695, Cl. 514-372.000.

Winzenburg, Mark L.: *See—*
Fields, Ellis K.; and Winzenburg, Mark L., 4,560,761, Cl. 546-283.000.

Wirz, Walter, to Reishauer AG. Process for machining a spur gear by means of a rotating gear-like tool. 4,559,744, Cl. 51-287.000.

Witco Chemical Corporation: *See—*
Muir, Ron; and Blokhuis, William, 4,560,489, Cl. 252-33.400.

Witteman, Donald F.: *See—*
Witteman, Frank; Witteman, Richard T.; and Witteman, Donald F., 4,560,165, Cl. 273-183.00A.

Witteman, Frank; Witteman, Richard T.; and Witteman, Donald F. Golf practice device. 4,560,165, Cl. 273-183.00A.

Witteman, Richard T.: *See—*
Witteman, Frank; Witteman, Richard T.; and Witteman, Donald F., 4,560,165, Cl. 273-183.00A.

Witzigman, Charles J.: *See—*
Owen, Timothy C.; and Witzigman, Charles J., 4,559,699, Cl. 29-602.00R.

Wkosaner, Felix, to Fichtel & Sachs AG. Shock absorber unit with temperature compensation. 4,560,041, Cl. 188-278.000.

WOCO Franz-Josef Wolf & Co.: *See—*
Wolf, Franz-Josef; and Pletsch, Hubert, 4,560,367, Cl. 464-83.000.

Wolf, Franz-Josef; and Pletsch, Hubert, to WOCO Franz-Josef Wolf & Co. Torsionally elastic coupling. 4,560,367, Cl. 464-83.000.

Wolf, Heinz; and Emmel, Werner, to Metallgesellschaft Aktiengesellschaft. Valve for use in gasification reactor. 4,559,972, Cl. 137-614.110.

Wolfer, Peter: *See*—
Engeler, Paul; and Wolfer, Peter, 4,559,821, Cl. 73-167.000.

Wolfram, Roland, to Siemens Aktiengesellschaft. Traveling-wave tube with a periodic permanent-magnet focusing system. 4,560,904, Cl. 315-3.500.

Wolfson, Sumner H., to Burr-Brown Corporation. Heater preform for sealing a closure. 4,560,084, Cl. 220-359.000.

Wolter, Eric H.: *See*—
Moller, Craig A.; and Wolter, Eric H., 4,560,348, Cl. 432-77.000.

Wood, David B., III, to Cincinnati Milacron Inc. Spindle mounting assembly with squeeze film damping. 4,560,289, Cl. 384-99.000.

Woodhouse, John L., to Lucas Industries Limited. Electric storage batteries. 4,560,629, Cl. 429-184.000.

Wray, Ashton, Jr.: *See*—
Manning, Phillip R., 4,560,858, Cl. 219-137.520.

Wray, Gary Q.: *See*—
Winslow, Donald W.; and Wray, Gary Q., 4,560,004, Cl. 166-321.000.

Wright, Basil M.; and Haire, Christopher A. R., to Pye (Electronic Products) Limited. Apparatus for detecting changes in shape of a body. 4,559,953, Cl. 128-680.000.

Wright, Charles D.: *See*—
Millet, George H.; Harrell, Edward R.; and Wright, Charles D., 4,560,723, Cl. 524-486.000.

Wright, Randall J. Pitch measuring apparatus. 4,559,714, Cl. 33-379.000.

Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, to Monsanto Company. Catalysts for the production of maleic anhydride. 4,560,674, Cl. 502-209.000.

Wu, Chung P.; and Kolondra, Frank, to RCA Corporation. Method and apparatus for implantation of doubly-charged ions. 4,560,879, Cl. 250-492.200.

Wucherpfennig, Karl; Bott, Ernst W.; and Schottler, Peter, to Westfalia Separator AG. Method of stabilizing must, still wines and sparkling wines with respect to precipitation. 4,560,565, Cl. 426-330.400.

Wyatt, James L. Adjustable carrier assembly for a vertical louver with spacer link. 4,559,670, Cl. 16-87.200.

Wycech, Joseph. Funnel. 4,559,984, Cl. 141-340.000.

Xenofontov, Alexei M.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Xerox Corporation: *See*—
Hoffend, Thomas R.; and Barbetta, Angelo J., 4,560,635, Cl. 430-106.600.
Schieck, Richard A., 4,559,855, Cl. 83-425.300.
Sprague, Robert A., 4,560,994, Cl. 346-108.000.
Wilson, Lionel A., 4,560,158, Cl. 271-165.000.
Yip, Kwok-leung; and Banton, Martin E., 4,561,023, Cl. 358-208.000.

Xomox Corporation: *See*—
Gardner, John F.; and Showalter, Thomas W., 4,559,967, Cl. 137-340.000.

Yakovenko, Ivan F.: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Yamada, Koichiro: *See*—
Yoshioka, Masahiro; Mizumoto, Muneo; and Yamada, Koichiro, 4,560,325, Cl. 417-407.000.

Yamada, Sadayoshi: *See*—
Motomura, Noriyuki; Tsuboi, Hiroyuki; and Yamada, Sadayoshi, 4,559,991, Cl. 164-457.000.

Yamada, Yasuji: *See*—
Fukushima, Masanori; Hirai, Osamu; Manda, Toshitaka; Kikuchi, Hiroyuki; Tsukitani, Yasumasa; Shimizu, Iwao; and Yamada, Yasuji, 4,560,703, Cl. 514-530.000.

Yamada, Yasutsugu, to Nippon Tensaiseito Kabushiki Kaisha. Wood improver and a method of improving the quality of wood. 4,560,619, Cl. 428-541.000.

Yamada, Yu: *See*—
Tokuhara, Mitsuhiro; and Yamada, Yu, 4,560,242, Cl. 350-425.000.

Yamada, Yukiyoshi; and Yasuguchi, Masayuki, to Nisshin Flour Milling Co. Ltd.; and Nisshin Engineering Co., Ltd. Powder classifier. 4,560,471, Cl. 209-144.000.

Yamaguchi, Kinya: *See*—
Kobayashi, Yukio; Yamaguchi, Kinya; and Kira, Masaaki, 4,560,633, Cl. 429-213.000.

Yamaguchi, Kiyoshi. Bicycle. 4,560,182, Cl. 280-257.000.

Yamaguchi, Shigehiro: *See*—
Takafuji, Hideo; Minamida, Katsuhiro; and Yamaguchi, Shigehiro, 4,560,855, Cl. 219-121.0LD.

Yamaguchi, Yoshitake: *See*—
Akahane, Naoto; Yamaguchi, Yoshitake; Matsuura, Takeshi; and Watatani, Seiji, 4,561,034, Cl. 360-134.000.

Yamaguchi, Yuji; and Kawai, Shinji, to Aisin Seiki Kabushiki Kaisha. Valve unit for a washing device of private parts of human body. 4,559,964, Cl. 137-107.000.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Egawa, Yoshinori, 4,560,216, Cl. 339-12.00V.

Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Control system for a plurality of engine units. 4,560,021, Cl. 180-54.100.

Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, to Central Glass Company, Limited. Piezoelectric polymeric material. 4,560,737, Cl. 527-72.000.

Yamamoto, Koji: *See*—
Miyamoto, Akira; Shimizu, Senzo; Okamura, Masayoshi; Tanisake, Hiroka; Higuchi, Yasumitsu; Hidaka, Toshio; Yamamoto, Koji; and Abe, Toshiyuki, 4,560,788, Cl. 560-91.000.

Yamamoto, Norio: *See*—
Kikegawa, Shinko; Arai, Takao; Yamamoto, Norio; and Ozaki, Kiyoharu, 4,560,414, Cl. 106-281.00R.

Yamamoto, Yasuo: *See*—
Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, 4,560,713, Cl. 523-400.000.

Yamamoto, Yoshimi: *See*—
Toyama, Hiroshige; Mizuno, Yoshiyuki; Yamamoto, Yoshimi; and Kato, Mitsuru, 4,560,115, Cl. 242-107.40A.

Yamamoto, Yukio: *See*—
Kato, Yasuji; Kobayashi, Hiroyuki; and Yamamoto, Yukio, 4,560,861, Cl. 235-105.000.

Yamanis, Jean; Carlson, Emery J.; and Armor, John N., to Allied Corporation. Oxidation of primary amines to oximes by elemental oxygen with catalyst regeneration. 4,560,797, Cl. 564-267.000.

Yamasa Tokei Meter Co., Ltd.: *See*—
Kato, Yasuji; Kobayashi, Hiroyuki; and Yamamoto, Yukio, 4,560,861, Cl. 235-105.000.

Yamashiro, Osamu: *See*—
Yoh, Kanji; Yamashiro, Osamu; and Meguro, Satoshi, 4,559,694, Cl. 29-571.000.

Yamatake, Mineo, to National Semiconductor Corporation. Comparator circuit with built in reference. 4,560,921, Cl. 323-316.000.

Yamato Scale Company, Limited: *See*—
Hirano, Takashi, 4,559,981, Cl. 141-83.000.

Yamazaki Machinery Works, Ltd.: *See*—
Iguchi, Hideaki; Sakai, Takayoshi; and Ohashi, Hajime, 4,561,050, Cl. 364-167.000.

Yamazaki, Shohei, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic focusing device in an optical type data reproducing apparatus. 4,561,080, Cl. 369-45.000.

Yanagisawa, Yasuhisa; and Tsukiji, Yasuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Parking system for an articulated tricycle. 4,560,026, Cl. 180-287.000.

Yanase, Takeyasu: *See*—
Satoh, Yoshio; Yanase, Takeyasu; and Komenou, Kazunari, 4,561,069, Cl. 365-36.000.

Yasuguchi, Masayuki: *See*—
Yamada, Yukiyoshi; and Yasuguchi, Masayuki, 4,560,471, Cl. 209-144.000.

Yasumura, Takashi: *See*—
Yamamoto, Kazuhiko; Nejigaki, Kazumi; Yasumura, Takashi; Kawashima, Chikashi; and Inoue, Shuichi, 4,560,737, Cl. 527-72.000.

Yasumuro, Hisakazu: *See*—
Watanabe, Michio; Ishibashi, Kazuhisa; Yasumuro, Hisakazu; Kurashima, Hideo; and Imatani, Tsuneo, 4,560,430, Cl. 156-285.000.

Yatabe, Fumio: *See*—
Toyama, Shozo; and Yatabe, Fumio, 4,559,917, Cl. 123-571.000.

Yau, Ben J., to Owens-Corning Fiberglas Corporation. Mat binders. 4,560,612, Cl. 428-288.000.

Yeh, Chuen Y.; and Savini, Charles, to Exxon Research & Engineering Co. Catalysts and process for oxidation of olefins to ketones. 4,560,803, Cl. 568-401.000.

Yeh, Chuen Y.; and Savini, Charles, to Exxon Research & Engineering Co. Catalytic process for the manufacture of ketones. 4,560,804, Cl. 568-408.000.

Yeh, Chuen Y.; and Savini, Charles, to Exxon Research & Engineering Co. Catalysts and process for the conversion of olefins to ketones. 4,560,805, Cl. 568-408.000.

Yellin, Jacob A.; and Koss, Richard N. Continuous forms for making indexes. 4,560,600, Cl. 428-43.000.

Yeretzian, Georges: *See*—
Coquillart, Michel; and Yeretzian, Georges, 4,559,681, Cl. 29-26.00A.

Yip, Kwok-leung; and Banton, Martin E., to Xerox Corporation. Dampening system for micro-deflector scanning beam modulator. 4,561,023, Cl. 358-208.000.

Yoh, Kanji; Yamashiro, Osamu; and Meguro, Satoshi, to Hitachi, Ltd. Method of manufacturing a reference voltage generator device. 4,559,694, Cl. 29-571.000.

Yokogawa Hokushin Electric Corporation: *See*—
Suga, Tateo; Tamura, Hiroshi; Taguchi, Masaaki; and Suzuki, Tokio, 4,560,995, Cl. 346-136.000.

Yokota, Norio: *See*—
Takagi, Shigehide; Yokota, Norio; Sato, Syohei; and Nishi, Toshihiro, 4,560,413, Cl. 106-120.000.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Power amplifier. 4,560,946, Cl. 330-149.000.

Yokoyama, Masato; Nagasaku, Eiichi; Taya, Tosiki; and Kato, Toshiyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary vane-type compressor with vanes of more thermally expansible material than rotor for maintaining separation of rotor from housing side plate during high temperature operation. 4,560,332, Cl. 418-83.000.

Yokoyama, Naokata, to Ciba-Geigy Corporation. Heterocyclic-fused pyrazolo-[3,4-d]pyridin-3-ones as benzodiazepine receptor modulators. 4,560,689, Cl. 514-250.000.

Yonekawa, Motoki: *See*—
Sugino, Kenji; Sugino, Yoshihiro; Tatsuguchi, Mikio; Eda, Kensaku; Kasai, Yoichi; Nishisaka, Tsuyoshi; and Yonekawa, Motoki, 4,560,373, Cl. 604-30.000.

Yonezawa, Toshio; Ajima, Takashi; Hiraki, Shunichi; Koshino, Yutaka; and Oka, Yoshitami, to Toyko Shibaura Electric Co., Ltd. Method of manufacturing a semiconductor device. 4,560,642, Cl. 430-313.000.

Yonezawa, Toshio; and Aoyama, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device. 4,561,009, Cl. 357-67.000.

Yong, Raymond N.; and Sethi, Amar J., to Suncor, Inc. Hydrolyzed dasheen starch flocculants. 4,560,416, Cl. 127-33.000.

Yoshida, Masahiro; and Nakagawa, Kenji, to Hoya Corporation. High strength glass-ceramic containing apatite and alkaline earth metal silicate crystals and process for producing thc same. 4,560,666, Cl. 501-5.000.

Yoshida, Masumi; and Masui, Takeshi, to Fujitsu Limited. Character recognition process and apparatus. 4,561,106, Cl. 382-49.000.

Yoshida, Toshimi; Nakata, Kiyotomo; Masaoka, Isao; and Itow, Hisawo, to Hitachi, Ltd. Alloy for use in a radioactive ray environment and reactor core members. 4,560,407, Cl. 75-128.00N.

Yoshihara, Mitsuo; Morikawa, Yoshitada; Yamamoto, Yasuo; Komada, Mitsuharu; and Hattori, Masaaki, to Nitto Electric Industrial Co., Ltd. Reinforced plastic molding. 4,560,713, Cl. 523-400.000.

Yoshioka, Masahiro; Mizumoto, Muneo; and Yamada, Koichiro, to Hitachi, Ltd. Bearing support for turbochargers. 4,560,325, Cl. 417-407.000.

Yoshioka, Shigeyoshi, to Atago Bussan Co. Ltd. Diffraction grating mounting device for scanning monochromator. 4,560,276, Cl. 356-334.000.

Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Guide rail for automatic seat belt. 4,560,187, Cl. 280-804.000.

Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, to Mitsubishi Denki Kabushiki Kaisha. Alternating current generator system for a car. 4,560,916, Cl. 322-86.000.

Yoshizaki, Akira: *See*—
Ueda, Hiroshi; Yoshizaki, Akira; and Masaki, Yasuo, 4,560,261, Cl. 354-121.000.

Young, David E.; and Boyes, David H., to Universal House. Fracture cast braces. 4,559,935, Cl. 128-88.000.

Young, James P., to Rockwell International Corporation. High speed AGC circuit. 4,560,949, Cl. 330-284.000.

Younkin, Harry A.; Mehnert, Gottfried; and Roos, Uwe V., to Hercules Inc. Apparatus for forming oriented containers. 4,560,340, Cl. 425-526.000.

Yu, S. Gary; and Reynolds, John G., to Chevron Research Company. Presulfided red mud as a first-stage catalyst in a two-stage, close-coupled thermal catalytic hydroconversion process. 4,560,465, Cl. 208-59.000.

Yung, Kenneth K.; Barlow, Craig B.; and Glass, Joe R., to Exxon Research and Engineering Co. Curing and leaching process for metal ores. 4,560,538, Cl. 423-3.000.

Zagoroff, Dimiter S. Passive anti-theft device for vehicle ignition lock. 4,559,795, Cl. 70-422.000.

Zahir, Abdul-Cader, to Ciba-Geigy Corporation. Triglycidyl compounds of aminophenols. 4,560,739, Cl. 528-99.000.

Zahner, Pierre W., to Mavilor Systemes S.A. Electric motor equipped with inner blocking brake. 4,560,895, Cl. 310-77.000.

Zally, William J.: *See*—
Field, George F.; and Zally, William J., 4,560,692, Cl. 514-313.000.

Zambelli, Hans D.: *See*—
Haug, Walter; and Zambelli, Hans D., 4,560,303, Cl. 404-118.000.

Zambon S.p.A.: *See*—
Carenzi, Angelo; Chiarino, Dario; Della Bella, Davide; Frigeni, Viviana; and Veneziani, Carlo, 4,560,696, Cl. 514-397.000.

Zava, Francis; and Coppa, Louis, to Commissariat a l'Energie Atomique. Device for the checking of a spring from a remote location. 4,559,820, Cl. 73-161.000.

Zavod-Vtuż Pri Moskovskom Avtomobilnom Zavode Imeni I.A. Likhacheva: *See*—
Ganago, Oleg A.; Safonov, Anatoly V.; Stepanov, Boris A.; Subich, Vadim N.; Frolov, Alexandr D.; Lobanov, Nikolai A.; Lumer, Yakov L.; Xenofontov, Alexei M.; Rudman, Leonid I.; Lebed, Alexandr D.; Mamatsashvili, Vazha I.; Kljuchnikov, Valery F.; Birkadze, Dzhemal I.; Shklyarman, Sergei S.; Gordeev, Nikolai A.; Bocharov, Jury A.; Golovin, Vasily Y.; Kruk, Alexandr T.; Yakovenko, Ivan F.; Novikov, Vladimir V.; Grishkov, Andrei M.; Gorozhankin, Valery N.; Sergeev, Jury N.; and Svistunov, Vladimir E., 4,559,807, Cl. 72-454.000.

Zeikus, Joseph G.: *See*—
Datta, Rathin; and Zeikus, Joseph G., 4,560,658, Cl. 435-160.000.

Zenith Electronics Corporation: *See*—
Midland, Richard W., 4,560,910, Cl. 315-382.000.

Zeumer, Monika; and Straszewski, Klaus, to Autoflug GmbH. Height-adjustment device for a motor-vehicle safety belt. 4,560,204, Cl. 297-483.000.

Ziegel, Douglas H., to RCA Corporation. Positioning and bonding a diamond to a stylus shank. 4,560,853, Cl. 219-121.0LD.

Ziemen, Ernst-August: *See*—
Jung, Eggert; Roes, Christian; Wigger, Andreas; and Ziemen, Ernst-August, 4,561,016, Cl. 358-76.000.

Zimmerman, Carle C., Jr.: *See*—
Schroeder, Donald E., Jr.; Plummer, Mark A.; and Zimmerman, Carle C., Jr., 4,560,517, Cl. 260-505.00R.

Zimmermann, Horst; and Lorenz, Joachim, to MTU Motoren-und Turbinen-Union Munchen GmbH. Non-contacting sealing arrangement for a rotating part. 4,560,172, Cl. 277-3.000.

Zimmermann, Rainer: *See*—
Roch, Josef; Nickl, Josef; Muller, Erich; Narr, Berthold; Weisenberger, Johannes; Zimmermann, Rainer; and Haarmann, Walter, 4,560,685, Cl. 514-222.000.

Zoche, Gunter; and Vogt, Wilhelm, to Dynamit Nobel AG. Process for preparing 10,11-dihydro-5H-dibenzo[a,d]cycloheptene-5-one compounds. 4,560,787, Cl. 560-52.000.

Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,560,752, Cl. 544-66.000.

Zuckerman, Ben H.: *See*—
Cory, John H.; and Zuckerman, Ben H., 4,559,658, Cl. 5-433.000.

Zumstein, Bruno: *See*—
Jenny, Ernst; and Zumstein, Bruno, 4,559,784, Cl. 60-606.000.

Zupan, Jacob A., to Merck & Co., Inc. Use of eucalyptol for enhancing skin permeation of bio-affecting agents. 4,560,553, Cl. 424-78.000.

Zwicker Knitting Mills: *See*—
Ertl, James L., 4,559,646, Cl. 2-16.000.

Zylbert, Thaddeus J., to Singer Company, The. Thread guide construction. 4,559,886, Cl. 112-302.000.

501 P.M. Filter Konstruktionen: *See*—
Moldow, Preben G., 4,560,477, Cl. 210-457.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF DECEMBER, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ammann, David W.: *See*—
Granzow, Daniel B.; Carter, Garry L.; and Ammann, David W., Re. 32,056, Cl. 141-1.000.

Animal Veterinary Products, Inc.: *See*—
Rosenberg, Alexander J.; and Rosenberg, Philip M., Re. 32,052, Cl. 119-103.000.

Baxter Travenol Laboratories, Inc.: *See*—
Granzow, Daniel B.; Carter, Garry L.; and Ammann, David W., Re. 32,056, Cl. 141-1.000.

Carter, Garry L.: *See*—
Granzow, Daniel B.; Carter, Garry L.; and Ammann, David W., Re. 32,056, Cl. 141-1.000.

Englund, Rolf A.: *See*—
Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., Re. 32,055, Cl. 418-1.000.

Granzow, Daniel B.; Carter, Garry L.; and Ammann, David W., to Baxter Travenol Laboratories, Inc. Method of forming a connection between two sealed conduits using radiant energy. Re. 32,056, Cl. 141-1.000.

Mehlum, Even, to Sentralinstitutt For Industriell Forskning. Arrangement for concentrating sea waves. Re. 32,054, Cl. 405-76.000.

Rosenberg, Alexander J.; and Rosenberg, Philip M., to Animal Veterinary Products, Inc. Veterinary examination table. Re. 32,052, Cl. 119-103.000.

Rosenberg, Philip M.: *See*—
Rosenberg, Alexander J.; and Rosenberg, Philip M., Re. 32,052, Cl. 119-103.000.

Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., to Sullair Technology AB. Method of operation for an oil-injected screw-compressor. Re. 32,055, Cl. 418-1.000.

Sentralinstitutt For Industriell Forskning: *See*—
Mehlum, Even, Re. 32,054, Cl. 405-76.000.

Sullair Technology AB: *See*—
Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., Re. 32,055, Cl. 418-1.000.

Willcox, Frederick P. Articulated ribbon-guiding structure. Re. 32,053, Cl. 400-208.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Head, Howard, to Prince Manufacturing, Inc. Tennis racket. B1 3,999,756, 12-24-85, Cl. 273-73.00C.

Prince Manufacturing, Inc.: *See*—
Head, Howard, B1 3,999,756, Cl. 273-73.00C.

LIST OF DESIGN PATENTEES

Abel, William E., to Sentrol, Inc. Surface mount housing for a security system transmitter. 281,865, 12-24-85, Cl. D10-106.000.

Abel, William E., to Sentrol, Inc. Housing for a transmitter for a security alarm system. 281,866, 12-24-85, Cl. D10-106.000.

Addleman, Keith A., to Quality Industries, Inc. Wagon playground climber and slide. 281,892, 12-24-85, Cl. D21-244.000.

Addleman, Keith A., to Quality Industries, Inc. Tractor playground climber. 281,893, 12-24-85, Cl. D21-245.000.

Alex Synn AG: *See*—
Hopfer, Hans, 281,839, Cl. D6-335.000.

Ali, Christopher A. Drill bit organizer. 281,835, 12-24-85, Cl. D3-74.000.

American Commercial Incorporated: *See*—
Everhan, Walter, 281,846, Cl. D7-9.000.
Laslo, Larry R., 281,847, Cl. D7-9.000.
Murai, Toschio, 281,848, Cl. D7-9.000.

American Motors Corporation: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,872, Cl. D12-169.000.

Ashmun, David S., Jr., to John Fluke Mfg. Co., Inc. Electronic instrument meter cover. 281,864, 12-24-85, Cl. D10-80.000.

Bailey, Donald V.; and Bartasevich, William E., to Blue Lustre Home Care Products, Inc. Hot water extraction carpet cleaner. 281,919, 12-24-85, Cl. D32-21.000.

Bakic, Dieter, to Revlon, Inc. Cosmetic case. 281,913, 12-24-85, Cl. D28-83.000.

Barnstone, Gertrude L. Eyeglass holder. 281,843, 12-24-85, Cl. D6-449.000.

Barrows, George F., II; and Barrows, Niela P. Insulated switch cover for vehicle ignitions. 281,858, 12-24-85, Cl. D8-352.000.

Barrows, Niela P.: *See*—
Barrows, George F., II; and Barrows, Niela P., 281,858, Cl. D8-352.000.

Bartasevich, William E.: *See*—
Bailey, Donald V.; and Bartasevich, William E., 281,919, Cl. D32-21.000.

Basgall, Dale G. Tight spot wrench. 281,853, 12-24-85, Cl. D8-23.000.

Bate, Bettina A.: *See*—
Bate, Richard L.; and Bate, Bettina A., 281,889, Cl. D21-59.000.

Bate, Richard L.; and Bate, Bettina A. Tethered jump toy. 281,889, 12-24-85, Cl. D21-59.000.

Bechtel, Daniel L. Pistol telescope mount. 281,894, 12-24-85, Cl. D22-7.000.

Beechuk, Timothy J.; and Neu, Edwin F., to Procter & Gamble Company, The. Bottle. 281,863, 12-24-85, Cl. D9-389.000.

Bertrand, Paul, to Pernod Richard S.A. Bottle. 281,862, 12-24-85, Cl. D9-385.000.

Biosafety Systems, Inc.: *See*—
Gianni, Richard F., 281,906, Cl. D24-99.000.
Gianni, Richard F., 281,907, Cl. D24-99.000.

Blocklinger, Dale. Combined book and computer accessories support unit. 281,842, 12-24-85, Cl. D6-419.000.

Blue Lustre Home Care Products, Inc.: *See*—
Bailey, Donald V.; and Bartasevich, William E., 281,919, Cl. D32-21.000.

Braathen, Gary A. Fishing lure. 281,897, 12-24-85, Cl. D22-27.000.

Brown, Ned D. Cabinet for automated bank teller machine. 281,922, 12-24-85, Cl. D99-28.000.

C. B. Fleet Company, Inc.: *See*—
Duffy, Brian F., 281,903, Cl. D24-21.000.

Callaghan, Paulette. Women's pants or the like. 281,828, 12-24-85, Cl. D2-28.000.

Cantor, Alicia. Diet plate. 281,849, 12-24-85, Cl. D7-27.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalis, Javier B., to John J. Madison Company, Inc. Figurine of a wild rabbit. 281,868, 12-24-85, Cl. D11-158.000.

Carbajales Santa-Eulalis, Javier B.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalis, Javier B., 281,868, Cl. D11-158.000.
Carlson, Arthur R. Water level float for use in planters. 281,869, 12-24-85, Cl. D11-164.000.
Carney, Jody E. Baby sling and harness for infants with gastro-esophageal reflux. 281,833, 12-24-85, Cl. D3-31.000.
Carter, Randy E.; and Schmidt, Ernst R. Refrigerator door panel with eye-level controls. 281,883, 12-24-85, Cl. D15-91.000.
Chemical New York Corporation: *See—*
Losi, Paul F., 281,921, Cl. D99-28.000.
Chevron Research Company: *See—*
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,899, Cl. D23-18.000.
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,900, Cl. D23-18.000.
Chikamatsu, Eiko: *See—*
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, 281,877, Cl. D14-6.000.
Clarks Limited: *See—*
Radford, Alfred D., 281,829, Cl. D2-309.000.
Communications Packaging Corporation: *See—*
Rose, Robert D., Jr.; and Phillips, Kenneth J., 281,834, Cl. D3-35.000.
Consolidated Devices, Inc.: *See—*
Grabovac, Bosko, 281,854, Cl. D8-24.000.
CPG Products Corp.: *See—*
Routzong, James E.; and Ventura, Frank D., 281,890, Cl. D21-174.000.
Dart Industries Inc.: *See—*
Picozza, Augusto A., 281,859, Cl. D8-367.000.
Deere & Company: *See—*
Swartzendruber, James A.; Rehn, Gary A.; and Self, Edwin C., 281,881, Cl. D15-33.000.
DeMayo, Victor E., to Gutmann Cutlery, Inc. Knife sheath. 281,896, 12-24-85, Cl. D22-13.000.
Demrick, Carl J.; and Hussey, Ronald D., to Shepherd Products Limited. Picture window fireplace screen. 281,901, 12-24-85, Cl. D23-138.300.
Derviss, Richard, to Zyloware Corporation. Eyeglass frame. 281,885, 12-24-85, Cl. D16-102.000.
Dinnebier, Johannes; and Sarpaneva, Timo, to Rosenthal Aktiengesellschaft. Candlestick. 281,910, 12-24-85, Cl. D26-11.000.
Drackett Company, The: *See—*
Jones, David A.; and Zogg, Jon R., 281,861, Cl. D9-377.000.
Drag Specialties, Inc.: *See—*
Rudd, Thomas H., 281,912, Cl. D26-28.000.
Stahel, Alwin J., 281,875, Cl. D12-182.000.
Duffy, Brian F., to C. B. Fleet Company, Inc. Fecal occult blood test kit. 281,903, 12-24-85, Cl. D24-21.000.
Dunbar Furniture, Inc.: *See—*
Kelly, Steven M., 281,876, Cl. D13-24.000.
Everhan, Walter, to American Commercial Incorporated. Cup. 281,846, 12-24-85, Cl. D7-9.000.
Fujii, Takashi: *See—*
Kashima, Taisuke; Kiyota, Toru; and Fujii, Takashi, 281,880, Cl. D14-81.000.
Gianni, Richard F., to Biosafety Systems, Inc. Disposal container for hypodermic needles. 281,906, 12-24-85, Cl. D24-99.000.
Gianni, Richard F., to Biosafety Systems, Inc. Disposal container for hypodermic needles. 281,907, 12-24-85, Cl. D24-99.000.
Glick, Eliot M. Money saving container. 281,923, 12-24-85, Cl. D99-37.000.
Grabovac, Bosko, to Consolidated Devices, Inc. Force selector and readout unit for torque tools. 281,854, 12-24-85, Cl. D8-24.000.
Groves, Michael H., to Stanley Works Limited, The. Planing tool. 281,857, 12-24-85, Cl. D8-101.000.
Guichard, Gary D.: *See—*
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,872, Cl. D12-169.000.
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, to Chevron Research Company. Garden sprayer. 281,899, 12-24-85, Cl. D23-18.000.
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, to Chevron Research Company. Lawn sprayer. 281,900, 12-24-85, Cl. D23-18.000.
Gutmann Cutlery, Inc.: *See—*
DeMayo, Victor E., 281,896, Cl. D22-13.000.
Hale, Thomas K.: *See—*
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,899, Cl. D23-18.000.
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,900, Cl. D23-18.000.
Hamatani, George. Conveyor chain tool. 281,856, 12-24-85, Cl. D8-72.000.
Harley-Davidson Motor Co., Inc.: *See—*
Heiman, John A., 281,871, Cl. D12-114.000.
Hayashi, Shigeaki: *See—*
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, 281,886, Cl. D18-7.000.
Heiman, John A., to Harley-Davidson Motor Co., Inc. Motorcycle combined radio and speaker support. 281,871, 12-24-85, Cl. D12-114.000.
Heinrich Kuhn Metallwarenfabrik AG: *See—*
Kuhn, Jacques, 281,855, Cl. D8-42.000.
Hengesbach, Robert W. Belt-supported canister holster. 281,830, 12-24-85, Cl. D2-400.000.
Hitachi, Ltd.: *See—*
Kashima, Taisuke; Kiyota, Toru; and Fujii, Takashi, 281,880, Cl. D14-81.000.
Hiykel, John G.: *See—*
Swesey, Daniel E.; and Hiykel, John G., 281,867, Cl. D11-98.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nakano, Koji, 281,870 Cl. D12-110.000.
Hopfer, Hans, to Alex Synn AG. Sofa bed or similar article. 281,839, 12-24-85, Cl. D6-335.000.
Hussey, Ronald D.: *See—*
Demrick, Carl J.; and Hussey, Ronald D., 281,901, Cl. D23-138.300.
Ireco, Inc.: *See—*
Nadherny, Rudolph E., 281,860, Cl. D8-382.000.
Ishii, Jun; and Murai, Kanji, to Tokyo Shibaura Denki Kabushiki Kaisha. Radio receiver. 281,879, 12-24-85, Cl. D14-70.000.
John Fluke Mfg. Co., Inc.: *See—*
Ashmun, David S., Jr., 281,864, Cl. D10-80.000.
John J. Madison Company, Inc.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalis, Javier B., 281,868, Cl. D11-158.000.
Jones, David A.; and Zogg, Jon R., to Drackett Company, The. Bottle. 281,861, 12-24-85, Cl. D9-377.000.
Kabushiki Kaisha Epson Corporation: *See—*
Kawakami, Yoshikazu, 281,878, Cl. D14-57.000.
Kashima, Taisuke; Kiyota, Toru; and Fujii, Takashi, to Hitachi, Ltd. Television receiver. 281,880, 12-24-85, Cl. D14-81.000.
Kawakami, Yoshikazu, to Kabushiki Kaisha Epson Corporation; and Suwa Seikosha. Acoustically coupled modem. 281,878, 12-24-85, Cl. D14-57.000.
Kelly, Steven M., to Dunbar Furniture, Inc. Component for a wiring system. 281,876, 12-24-85, Cl. D13-24.000.
Kenitz, Jack E.: *See—*
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,872, Cl. D12-169.000.
King, Andrew J., to Madison Cycles Limited. Bicycle brake block. 281,874, 12-24-85, Cl. D12-180.000.
Kiyota, Toru: *See—*
Kashima, Taisuke; Kiyota, Toru; and Fujii, Takashi, 281,880, Cl. D14-81.000.
Knoll International, Inc.: *See—*
Smith, Harold A., 281,845, Cl. D6-522.000.
Krispinsky, George M.: *See—*
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,872, Cl. D12-169.000.
Kuhn, Jacques, to Heinrich Kuhn Metallwarenfabrik AG. Corkscrew. 281,855, 12-24-85, Cl. D8-42.000.
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, to Pioneer Electronic Corporation. Cassette tape recorder. 281,877, 12-24-85, Cl. D14-6.000.
Lacka, Cemal. Safe. 281,920, 12-24-85, Cl. D99-28.000.
Lapsins, Valdis. Radius curve template. 281,887, 12-24-85, Cl. D19-39.000.
Laslo, Larry R., to American Commercial Incorporated. Cup. 281,847, 12-24-85, Cl. D7-9.000.
Levine, Lawrence E. Combined pipe cleaner and lamp therefor. 281,918, 12-24-85, Cl. D32-14.000.
Lin, Chuen K. Tool box. 281,837, 12-24-85, Cl. D3-74.000.
Linkow, Leonard; and Valen, Maurice. Dental implant. 281,904, 12-24-85, Cl. D24-33.000.
Losi, Paul F., to Chemical New York Corporation. Mobile bank teller station. 281,921, 12-24-85, Cl. D99-28.000.
Loving, James A.; Weber, Howard F.; and Zierhut, Clarence, to Quest Medical, Inc. Intravenous metering instrument. 281,902, 12-24-85, Cl. D24-8.000.
Madison Cycles Limited: *See—*
King, Andrew J., 281,874, Cl. D12-180.000.
Matsushima, Hiroshi: *See—*
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, 281,877, Cl. D14-6.000.
McLain, Clifford E. Muzzle brake. 281,895, 12-24-85, Cl. D22-7.000.
Meckling, Ralph E., to Merrico, Inc. Candle lamp. 281,909, 12-24-85, Cl. D26-11.000.
Merrico, Inc.: *See—*
Meckling, Ralph E., 281,909, Cl. D26-11.000.
Microbit Inc.: *See—*
Varner, Donald D.; and Rhodes, G. W., 281,884, Cl. D15-199.000.
Mikami, Kumio: *See—*
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, 281,877, Cl. D14-6.000.
Milton, John L., to Milton Manufacturing, Inc. Bumper cap. 281,873, 12-24-85, Cl. D12-172.000.
Milton Manufacturing, Inc.: *See—*
Milton, John L., 281,873, Cl. D12-172.000.
Morin, Andre R., to Namaar Enterprises Inc. Combined drawer and chopping board therefor. 281,850, 12-24-85, Cl. D7-46.000.
Murai, Kanji: *See—*
Ishii, Jun; and Murai, Kanji, 281,879, Cl. D14-70.000.
Murai, Toschio, to American Commercial Incorporated. Cup. 281,848, 12-24-85, Cl. D7-9.000.
Myers, Sophia J.: *See—*
Myers, William E.; and Myers, Sophia J., 281,917, Cl. D30-3.000.

Myers, William E.; and Myers, Sophia J. Birdhouse. 281,917, 12-24-85, Cl. D30-3.000.
Nadherny, Rudolph E., to Ireco, Inc. Lading tie anchor. 281,860, 12-24-85, Cl. D8-382.000.
Nakano, Koji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 281,870, 12-24-85, Cl. D12-110.000.
Namaar Enterprises Inc.: *See*—
Morin, Andre R., 281,850, Cl. D7-46.000.
Neu, Edwin F.: *See*—
Beechuk, Timothy J.; and Neu, Edwin F., 281,863, Cl. D9-389.000.
Nielsen, Troy G. Multi-purpose splint. 281,905, 12-24-85, Cl. D24-64.000.
Nixon, Robert C.: *See*—
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., 281,872, Cl. D12-169.000.
Ogg, Richard K., to Stow & Davis Furniture Company. Chair. 281,840, 12-24-85, Cl. D6-366.000.
Olsson, Lars O. Roof shingle. 281,908, 12-24-85, Cl. D25-80.000.
Pack & Gibbs, Inc.: *See*—
Pack, Wayne E., 281,851, Cl. D7-301.000.
Pack, Wayne E., to Pack & Gibbs, Inc. Beverage dispenser or similar article. 281,851, 12-24-85, Cl. D7-301.000.
Pernod Richard S.A.: *See*—
Bertrand, Paul, 281,862, Cl. D9-385.000.
Phillips, Kenneth J.: *See*—
Rose, Robert D., Jr.; and Phillips, Kenneth J., 281,834, Cl. D3-35.000.
Picozza, Augusto A., to Dart Industries Inc. Hook or the like. 281,859, 12-24-85, Cl. D8-367.000.
Pioneer Electronic Corporation: *See*—
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, 281,877, Cl. D14-6.000.
Poole, Bobby M. Clam digging tool. 281,852, 12-24-85, Cl. D8-13.000.
Procter & Gamble Company, The: *See*—
Beechuk, Timothy J.; and Neu, Edwin F., 281,863, Cl. D9-389.000.
Prommer, Walter. Mold for making ice cubes. 281,882, 12-24-85, Cl. D15-90.000.
Quality Industries, Inc.: *See*—
Addleman, Keith A., 281,892, Cl. D21-244.000.
Addleman, Keith A., 281,893, Cl. D21-245.000.
Quest Medical, Inc.: *See*—
Loving, James A.; Weber, Howard F.; and Zierhut, Clarence, 281,902, Cl. D24-8.000.
Radford, Alfred D., to Clarks Limited. Shoe. 281,829, 12-24-85, Cl. D2-309.000.
Rehn, Gary A.: *See*—
Swartzendruber, James A.; Rehn, Gary A.; and Self, Edwin C., 281,881, Cl. D15-33.000.
Revlon, Inc.: *See*—
Bakic, Dieter, 281,913, Cl. D28-83.000.
Rhodes, G. W.: *See*—
Varner, Donald D.; and Rhodes, G. W., 281,884, Cl. D15-199.000.
Rose, Robert D., Jr.; and Phillips, Kenneth J., to Communications Packaging Corporation. Audio cassette storage album. 281,834, 12-24-85, Cl. D3-35.000.
Rosenthal Aktiengesellschaft: *See*—
Dinnebier, Johannes; and Sarpaneva, Timo, 281,910, Cl. D26-11.000.
Routzong, James E.; and Ventura, Frank D., to CPG Products Corp. Toy monster. 281,890, 12-24-85, Cl. D21-174.000.
Rudd, Thomas H., to Drag Specialties, Inc. Combined motorcycle rotor cover light and air scoop. 281,912, 12-24-85, Cl. D26-28.000.
Sakaguchi, Hiroshi: *See*—
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, 281,886, Cl. D18-7.000.
Sarpaneva, Timo: *See*—
Dinnebier, Johannes; and Sarpaneva, Timo, 281,910, Cl. D26-11.000.
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, to Sharp Corporation. Electronic printing calculator. 281,886, 12-24-85, Cl. D18-7.000.
Schmidt, Ernst R.: *See*—
Carter, Randy E.; and Schmidt, Ernst R., 281,883, Cl. D15-91.000.
Self, Edwin C.: *See*—
Swartzendruber, James A.; Rehn, Gary A.; and Self, Edwin C., 281,881, Cl. D15-33.000.
Sentrol, Inc.: *See*—
Abel, William E., 281,865, Cl. D10-106.000.
Abel, William E., 281,866, Cl. D10-106.000.
Sharp Corporation: *See*—
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, 281,886, Cl. D18-7.000.
Shepherd Products Limited: *See*—
Demrick, Carl J.; and Hussey, Ronald D., 281,901, Cl. D23-138.300.
Shimano, Moto: *See*—
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,899, Cl. D23-18.000.
Gunzel, Rudolph M., Jr.; Hale, Thomas K.; and Shimano, Moto, 281,900, Cl. D23-18.000.
Shiverdecker, Howard. Fish lure. 281,898, 12-24-85, Cl. D22-28.000.
Shore Plastics, Inc.: *See*—
Sussman, Morris, 281,914, Cl. D28-83.000.
Sussman, Morris, 281,915, Cl. D28-83.000.
Smith, Carl R., to Weststar Marketing, Inc. Planter. 281,841, 12-24-85, Cl. D6-404.000.
Smith, Harold A., to Knoll International, Inc. Towel rack. 281,845, 12-24-85, Cl. D6-522.000.
Sparkman, Patricia K. Medical case. 281,836, 12-24-85, Cl. D3-74.000.
Spierto, Eleanor R. Lipstick blending machine. 281,916, 12-24-85, Cl. D28-99.000.
Stahel, Alwin J., to Drag Speciaities, Inc. Dual set of louvers for insertion in the openings of a motorcycle engine fairing. 281,875, 12-24-85, Cl. D12-182.000.
Stanley Works Limited, The: *See*—
Groves, Michael H., 281,857, Cl. D8-101.000.
Stow & Davis Furniture Company: *See*—
Ogg, Richard K., 281,840, Cl. D6-366.000.
Sugiyama, Minoru: *See*—
Uozumi, Sozen; and Sugiyama, Minoru, 281,888, Cl. D21-13.000.
Sussman, Morris, to Shore Plastics, Inc. Cosmetic compact. 281,914, 12-24-85, Cl. D28-83.000.
Sussman, Morris, to Shore Plastics, Inc. Cosmetic compact with slide-out drawers. 281,915, 12-24-85, Cl. D28-83.000.
Suwa Seikosha: *See*—
Kawakami, Yoshikazu, 281,878, Cl. D14-57.000.
Swartzendruber, James A.; Rehn, Gary A.; and Self, Edwin C., to Deere & Company. Plow frame. 281,881, 12-24-85, Cl. D15-33.000.
Swesey, Daniel E.; and Hiykel, John G. Guitar pick medallion. 281,867, 12-24-85, Cl. D11-98.000.
Teague, Richard A.; Nixon, Robert C.; Krispinsky, George M.; Kenitz, Jack E.; and Guichard, Gary D., to American Motors Corporation. Front bumper for automobile. 281,872, 12-24-85, Cl. D12-169.000.
Thompson, Bruce R. Hook. 281,838, 12-24-85, Cl. D6-323.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ishii, Jun; and Murai, Kanji, 281,879, Cl. D14-70.000.
Tomy Kogyo Company, Incorporated: *See*—
Uozumi, Sozen; and Sugiyama, Minoru, 281,888, Cl. D21-13.000.
Topp, Ronald. Ball tossing device. 281,891, 12-24-85, Cl. D21-210.000.
Trull, Douglas E. Carrier for compressed gas tanks and the like. 281,832, 12-24-85, Cl. D3-30.100.
Uozumi, Sozen; and Sugiyama, Minoru, to Tomy Kogyo Company, Incorporated. Game housing. 281,888, 12-24-85, Cl. D21-13.000.
Valen, Maurice: *See*—
Linkow, Leonard; and Valen, Maurice, 281,904, Cl. D24-33.000.
Varner, Donald D.; and Rhodes, G. W., to Microbit Inc. Motor side cover for a robatic arm. 281,884, 12-24-85, Cl. D15-199.000.
Ventura, Frank D.: *See*—
Routzong, James E.; and Ventura, Frank D., 281,890, Cl. D21-174.000.
Wada, Isao: *See*—
Kurata, Hideaki; Mikami, Kumio; Matsushima, Hiroshi; Wada, Isao; and Chikamatsu, Eiko, 281,877, Cl. D14-6.000.
Waldeck, William D. Countertop showcase. 281,844, 12-24-85, Cl. D6-472.000.
Weber, Howard F.: *See*—
Loving, James A.; Weber, Howard F.; and Zierhut, Clarence, 281,902, Cl. D24-8.000.
Weststar Marketing, Inc.: *See*—
Smith, Carl R., 281,841, Cl. D6-404.000.
White, Jill. Yarn holder. 281,831, 12-24-85, Cl. D3-23.000.
Williams Industries, Inc.: *See*—
Williams, William J., 281,911, Cl. D26-11.000.
Williams, William J., to Williams Industries, Inc. Candle lamp. 281,911, 12-24-85, Cl. D26-11.000.
Yamada, Kazuo: *See*—
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, 281,886, Cl. D18-7.000.
Zierhut, Clarence: *See*—
Loving, James A.; Weber, Howard F.; and Zierhut, Clarence, 281,902, Cl. D24-8.000.
Zogg, Jon R.: *See*—
Jones, David A.; and Zogg, Jon R., 281,861, Cl. D9-377.000.
Zyloware Corporation: *See*—
Derviss, Richard, 281,885, Cl. D16-102.000.

LIST OF PLANT PATENTEES

Conard-Pyle Company, The: *See*—
Meilland, Marie L., 5,607, Cl. 18.000.
Winchel, Joseph F., 5,608, Cl. 20.000.
Garabedian, John M. Plum tree, "Westerner". 5,609, 12-24-85, Cl. 38.000.
Garabedian, John M. Plum tree, Southerner. 5,610, 12-24-85, Cl. 38.000.
Hope, Claude, to Pan American Plant Company. Impatiens plant named Vista Impatiens No. 43. 5,612, 12-24-85, Cl. 68.000.
Hope, Claude, to Pan American Plant Company. Impatiens plant named Vista Impatiens No. 56. 5,613, 12-24-85, Cl. 68.000.
Meilland, Marie L., to Conard-Pyle Company, The. Rose plant-Meikola variety. 5,607, 12-24-85, Cl. 18.000.
Pan American Plant Company: *See*—
Hope, Claude, 5,612, Cl. 68.000.
Hope, Claude, 5,613, Cl. 68.000.
Tomatis, Simon. Ranunculus plant—Fever. 5,611, 12-24-85, Cl. 68.000.
Williams, Ernest D. Miniature rose plant/Minnco. 5,606, 12-24-85, Cl. 5.000.
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CLASSIFICATION OF PATENTS

ISSUED DECEMBER 24, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16 4,559,646
158 4,559,647

CLASS 3

13 4,560,383

CLASS 4

144.1 4,559,649
420 4,559,650
443 4,559,651
487 4,559,652
541 4,559,653

CLASS 5

66 4,559,655
236 R 4,559,656
255 4,559,654
286 4,559,657
433 4,559,658

CLASS 8

94.21 4,560,384
115.7 4,560,385
437 4,560,386
527 4,560,387
543 4,560,388

CLASS 14

71.3 4,559,659
71.5 4,559,660

CLASS 15

93 R 4,559,661
104.94 4,559,662
250.35 4,559,663
302 4,559,664
339 4,559,665
353 4,559,666
415 R 4,559,667

CLASS 16

35 R 4,559,668
44 4,559,669
87.2 4,559,670
111 R 4,559,671

CLASS 17

11 4,559,672

CLASS 19

82 4,559,673
102 4,559,674

CLASS 24

5 4,559,675
16 PB 4,559,676
300 4,559,677
323 4,559,678
615 4,559,679

CLASS 26

74 4,559,680

CLASS 29

26 A 4,559,681
4,559,682
91.1 4,559,683
156.4 R 4,559,684
156.5 R 4,559,685
4,559,686
157 C 4,559,687
157.3 R 4,559,688
243.52 4,559,689
270 4,559,690
283.5 4,559,691
441 R 4,559,692
571 4,559,693
4,559,694
572 4,559,695
576 B 4,559,696
590 4,559,697
598 4,559,698
602 R 4,559,699
623.1 4,559,700
759 4,559,702
876 4,559,703

CLASS 30

90.1 4,559,704

CLASS 33

1 B 4,559,705
23 R 4,559,706
125 C 4,559,707
178 E 4,559,710
178 F 4,559,709
178 R 4,559,708
199 R 4,559,711
201 4,559,712
302 4,559,713
379 4,559,714
438 4,559,715
529 4,559,716
568 4,559,717

CLASS 34

8 4,559,718
10 4,559,719
137 4,559,720
229 4,559,721

CLASS 36

89 4,559,722
102 4,559,723
129 4,559,724

CLASS 37

197 4,559,725
267 4,559,726

CLASS 40

10 R 4,559,727
124.2 4,559,728
306 4,559,729
324 4,559,730
546 4,559,731
595 4,559,732
606 4,559,733

CLASS 43

4 4,559,734
21.2 4,559,735
42.25 4,559,736
59 4,559,737

CLASS 44

1 R 4,560,389
15 R 4,560,390
51 4,560,391

CLASS 47

66 4,559,738

CLASS 49

177 4,559,739
216 4,559,740
462 4,559,741

CLASS 51

163.1 4,559,742
165 R 4,559,743
287 4,559,744

CLASS 52

1 4,559,745
2 4,559,746
40 4,559,747
90 4,559,748
221 4,559,749
238.1 4,559,750
665 4,559,751
670 4,559,752
748 4,559,753

CLASS 53

53 4,559,754
64 4,559,755
75 4,559,756
176 4,559,757
207 4,559,758
308 4,559,759
314 4,559,760
397 4,559,761
441 4,559,762
527 4,559,763
557 4,559,764
4,559,765
586 4,559,766
589 4,559,767

CLASS 55

5 4,560,393
16 4,560,394
276 4,560,395
287 4,560,396

CLASS 56

16.9 4,559,768
295 4,559,769
341 4,559,770

CLASS 57

6 4,559,771
247 4,559,772
261 4,559,773
263 4,559,774
340 4,559,775

CLASS 60

280 4,559,776
422 4,559,777
447 4,559,778
517 4,559,779
548 4,559,780
562 4,559,781
605 4,559,782
4,559,783
606 4,559,784
676 4,559,785

CLASS 62

28 4,560,397
29 4,560,398
55 4,559,786
55.5 4,559,787
98 4,559,788
157 4,559,789
259.3 4,559,790

CLASS 65

18.1 4,560,399

CLASS 66

75.1 4,559,791
125 R 4,559,792

CLASS 69

33 4,559,793
43 4,559,794

CLASS 70

422 4,559,795
432 4,559,796

CLASS 71

29 4,560,400
88 4,560,401
092 4,560,402
106 4,560,403

CLASS 72

63 4,559,797
81 4,559,798
224 4,559,799
342 4,559,800
348 4,559,801
349 4,559,802
354 4,559,803
356 4,559,804
384 4,559,805
391 4,559,806
454 4,559,807

CLASS 73

23 4,559,808
40.5 R 4,559,809
54 4,559,810
59 4,559,811
4,559,812
61.4 4,559,813
118 4,559,814
119 A 4,559,815
4,559,816
148 4,559,817
154 4,559,818
159 4,559,819
161 4,559,820
167 4,559,821
178 R 4,559,822
338 4,559,823
432 R 4,559,824
622 4,559,825
632 4,559,826
644 4,559,827
658 4,559,828
708 4,559,829
761 4,559,830
861.05 4,559,831
861.24 4,559,832
861.38 4,559,833
861.55 4,559,834
861.66 4,559,835
4,559,836
863.23 4,559,837

CLASS 74

50 4,559,838
88 4,559,839
89.21 4,559,840
191 4,559,841
336.5 4,559,842
451 4,559,843
471 R 4,559,844
600 4,559,845
665 GA 4,559,846
710.5 4,559,847
750 R 4,559,848
761 4,559,849
868 4,559,850

CLASS 75

0.5 C 4,560,404
12 4,560,405
30 4,560,406
128 A 4,560,408
128 N 4,560,407
130 R 4,560,409

CLASS 76

40 4,559,851
108 A 4,559,852

CLASS 81

420 4,559,853

CLASS 83

170 4,559,854
425.3 4,559,855
431 4,559,856
471.3 4,559,857
801 4,559,858

CLASS 84

394 4,559,859
422 S 4,559,860
470 R 4,559,861

CLASS 87

1 4,559,862

CLASS 91

165 4,559,863
454 4,559,864

CLASS 92

5 L 4,559,865
39 4,559,866

CLASS 98

1 4,559,867
2.08 4,559,868

CLASS 99

426 4,559,869

CLASS 100

215 4,559,870

CLASS 101

207 4,559,871
228 4,559,872
329 4,559,873
350 4,559,874

CLASS 102

218 4,559,875
520 4,559,876

CLASS 106

2 4,560,410
90 4,560,411
101 4,560,412
120 4,560,413
281 R 4,560,414
286.3 4,560,415

CLASS 108

64 4,559,877
132 4,559,878
136 4,559,879

CLASS 109

51 4,559,880
83 4,559,881

CLASS 110

254 4,559,882

CLASS 112

136 4,559,883
262.1 4,559,884
266.2 4,559,885
302 4,559,886
455 4,559,887

CLASS 114

45 4,559,894
74 R 4,559,888
153 4,559,889
230 4,559,890
263 4,559,891
270 4,559,892
304 4,559,893

CLASS 116

200 4,559,895

CLASS 118

300 4,559,896
406 4,559,897
653 4,559,898
657 4,559,899
672 4,559,900
723 4,559,901

CLASS 119

2 4,559,902
19 4,559,903
51 R 4,559,904
73 4,559,905
96 4,559,906
103 Re.32,052

CLASS 123

41.12 4,559,907
41.28 4,559,908
90.28 4,559,909
195 R 4,559,910
271 4,559,911
350 4,559,912
352 4,559,913
359 4,559,914
406 4,559,915
418 4,559,916
571 4,559,917

CLASS 124

78 4,559,918

CLASS 125

11 R 4,559,919
17 4,559,920

CLASS 126

263 4,559,921
271.2 A 4,559,922
307 R 4,559,923
426 4,559,924
430 4,559,925
438 4,559,926

CLASS 127

33 4,560,416

CLASS 128

1 R 4,559,927
6 4,559,928
33 4,559,929
70 4,559,930
77 4,559,932
78 4,559,933
79 4,559,931
80 E 4,559,934
88 4,559,935
92 R 4,559,936
132 D 4,559,937
156 4,559,938
201.28 4,559,939
206.26 4,559,940
207.18 4,559,941
303 4,559,942
303.14 4,559,943
335.5 4,559,945
344 4,559,944
419 D 4,559,946
419 PG 4,559,947
419 R 4,559,948
638 4,559,949
641 4,559,950
642 4,559,951
663 4,559,952
680 4,559,953
736 4,559,954

CLASS 131

198.2 4,559,955
303 4,559,956

CLASS 132

73 4,559,957

CLASS 133

4 A 4,559,958

CLASS 134

1 4,560,417
18 4,560,418
56 D 4,559,959
166 C 4,559,960
166 R 4,559,961

CLASS 135

85 4,559,962

CLASS 137

1 4,559,963
107 4,559,964
115 4,559,965
270 4,559,966
340 4,559,967
510 4,559,968
540 4,559,969
557 4,559,970
596.17 4,559,971
614.11 4,559,972

CLASS 138

138 4,559,973
172 4,559,974

CLASS 139

420 R 4,559,975
435 4,559,976

CLASS 140

93.6 4,559,977
147 4,559,978

CLASS 141

1 Re.32,056
9 4,559,979
11 4,559,980
83 4,559,981
206 4,559,982
260 4,559,983
340 4,559,984

CLASS 144

193 A 4,559,985
208 B 4,559,986
213 4,559,987

CLASS 148

1.5 4,560,419
4,560,420
4,560,421
33 4,560,422
111 4,560,423
150 4,560,424

CLASS 149

19.91 4,560,425

CLASS 156

64 4,560,426
73.3 4,560,427
94 4,560,428
208 4,560,429
285 4,560,430
359 4,560,431
459 4,560,432
4,560,433
474 4,560,434
643 4,560,435
4,560,436

CLASS 160

349 D 4,559,988

CLASS 162

65 4,560,437
194 4,560,438
261 4,560,439
263 4,560,440
273 4,560,441

CLASS 164

228 4,559,989
428 4,559,990
457 4,559,991
463 4,559,992

CLASS 165

1 4,559,993
41 4,559,994
47 4,559,995
76 4,559,996
94 4,559,997
109.1 4,559,998
156 4,559,999

CLASS 166

55.1 4,560,000
84 4,560,001
252 4,560,002
305.1 4,560,003
321 4,560,004
332 4,560,005

CLASS 168

48 A 4,560,006

CLASS 169

54 4,560,007

CLASS 171

14 4,560,008

CLASS 172

66 4,560,009
177 4,560,010
194 4,560,011

CLASS 174

52 FP 4,560,826
52 S 4,560,827
71 R 4,560,828
102 R 4,560,829

CLASS 175

61 4,560,012
73 4,560,013
107 4,560,014

CLASS 177

25 4,560,015
210 R 4,560,016
211 4,560,017

CLASS 178

19 4,560,830

CLASS 179

2 E 4,560,831
2 EA 4,560,832
2 TV 4,560,833
16 AA 4,560,835
16 F 4,560,834
18 BC 4,560,836
18 BD 4,560,837
81 B 4,560,840
81 C 4,560,839
81 R 4,560,838
4,560,841
4,560,842
170 NC 4,560,843

CLASS 180

9.1 4,560,018
9.32 4,560,019
53.1 4,560,020
54.1 4,560,021
65.1 4,560,022
148 4,560,023
176 4,560,024
247 4,560,025
287 4,560,026
312 4,560,027

CLASS 181

288 4,560,028

CLASS 182

5 4,560,029
118 4,560,030
129 4,560,031

CLASS 186

38 4,560,032

CLASS 188

2 F 4,560,033
72.3 4,560,034
72.8 4,560,035
73.32 4,560,036
73.38 4,560,037
4,560,038
73.45 4,560,039
77 R 4,560,040
278 4,560,041
322.21 4,560,042

CLASS 192

3.31 4,560,043
3.57 4,560,044
3.58 4,560,045
11 4,560,046
52 4,560,047
70.12 4,560,048
81 C 4,560,050
85 R 4,560,049
98 4,560,051
4,560,052
4,560,053
106.2 4,560,054
109 R 4,560,055
113 B 4,560,056

CLASS 198

347 4,560,057
426 4,560,058
735 4,560,059
803.5 4,560,060

CLASS 200

5 A 4,560,844
4,560,845
38 R 4,560,846
144 R 4,560,847
147 A 4,560,848

CLASS 203

2 4,560,442

CLASS 204

1 T 4,560,444
15 4,560,445
58.5 4,560,446
59 R 4,560,447
67 4,560,448
70 4,560,449
75 4,560,450
79 4,560,451
98 4,560,452
106 4,560,453
128 4,560,454
130 4,560,455
159.14 4,560,456
4,560,709
159.16 4,560,457
165 4,560,458
182.8 4,560,459
224 R 4,560,460
252 4,560,461
283 4,560,443
298 4,560,462
424 4,560,463
434 4,560,464

CLASS 206

3 4,560,061
44 R 4,560,062
159 4,560,064
427 4,560,065
501 4,560,066
554 4,560,067
4,560,068
591 4,560,069

CLASS 208

59 4,560,465
89 4,560,466
4,560,467
110 4,560,468
4,560,469
215 4,560,470

CLASS 209

144 4,560,471
664 4,560,070

CLASS 210

140 4,560,472
173 4,560,473
221.2 4,560,474
249 4,560,475
416.1 4,560,476
457 4,560,477
496 4,560,478
603 4,560,479
638 4,560,480
697 4,560,481
749 4,560,482
777 4,560,483
796 4,560,484

CLASS 211

70.8 4,560,071
75 4,560,072
184 4,560,073

CLASS 212

152 4,560,074

CLASS 215

13 R 4,560,075
252 4,560,076
307 4,560,077

CLASS 219

10.51 4,560,849
10.55 E 4,560,850
10.77 4,560,851
113 4,560,852
121 EW 4,560,854
121 LC 4,560,856
121 LD 4,560,853
4,560,855
130.21 4,560,857
137.52 4,560,858
386 4,560,859
470 4,560,860

CLASS 220

4 C 4,560,078
4 R 4,560,079
67 4,560,080
257 4,560,081
270 4,560,082
307 4,560,083
359 4,560,084
465 4,560,085

CLASS 221

24 4,560,086
73 4,560,087
75 4,560,088

CLASS 222

14 4,560,089
81 4,560,090
155 4,560,091
168 4,560,092
181 4,560,093
195 4,560,094
256 4,560,095

CLASS 224

42.42 4,560,096
160 4,560,097

CLASS 226

92 4,560,098
105 4,560,099

CLASS 228

40 4,560,100
54 4,560,101

CLASS 229

5.5 4,560,063
40 4,560,102

CLASS 235

105 4,560,861
467 4,560,862

CLASS 236

13 4,560,103
34.5 4,560,104
58 4,560,105
91 E 4,560,106

CLASS 239

3 4,560,107
222.17 4,560,108
583 4,560,109

CLASS 241

36 4,560,110
92 4,560,111
236 4,560,112
275 4,560,113

CLASS 242

71.8 4,560,114
107.4 A 4,560,115
118.11 4,560,116
199 4,560,117
215 4,560,118

CLASS 244

3.22 4,560,120
4,560,121
13 4,560,119
54 4,560,122
129.5 4,560,123

CLASS 248

27.1 4,560,124
55 4,560,125
72 4,560,126
210 4,560,127
230 4,560,128
278 4,560,129
297.2 4,560,130
352 4,560,131
396 4,560,132
442 4,560,133
511 4,560,134
558 4,560,135
559 4,560,136
652 4,560,137

CLASS 249

95 4,560,138
112 4,560,139

CLASS 250

201 4,560,863
4,560,864
213 VT 4,560,865
216 4,560,866
225 4,560,867
227 4,560,868
235 4,560,869
237 G 4,560,870
288 4,560,871
310 4,560,872
339 4,560,873
4,560,874
343 4,560,875
363 S 4,560,876
366 4,560,877
396 R 4,560,878
441.1 4,560,880
458.1 4,560,881
487.1 4,560,882
492.2 4,560,879
504 R 4,560,883

CLASS 251

11 4,560,140
167 4,560,141
306 4,560,142
338 4,560,143
344 4,560,144

CLASS 252

7 4,560,485
8.55 R 4,560,486
8.75 4,560,487
33 4,560,488
33.4 4,560,489
51.5 A 4,560,490
106 4,560,491
110 4,560,492
174.16 4,560,493
182 4,560,494
186.23 4,560,495
299.61 4,560,496
392 4,560,497
511 4,560,498
522 R 4,560,499
4,560,500
628 4,560,501
4,560,502
633 4,560,503

CLASS 254

93 HP 4,560,145
202 4,560,146
231 4,560,147
323 4,560,148

CLASS 260

112 B 4,560,504
112.5 R 4,560,505
4,560,506
239 A 4,560,507
4,560,508
239.3 P 4,560,509
244.4 4,560,510
396 R 4,560,511
397.2 4,560,512
403 4,560,513
410 4,560,514
465 D 4,560,515
465.5 A 4,560,516
505 R 4,560,517
970 4,560,518

CLASS 261

78 A 4,560,519

CLASS 264

22 4,560,520
24 4,560,521
41 4,560,522
102 4,560,523
105 4,560,524
136 4,560,525
328.2 4,560,526
500 4,560,527

CLASS 266

220 4,560,149

CLASS 267

35 4,560,150

CLASS 269

17 4,560,151
24 4,560,152
42 4,560,153

CLASS 271

10 4,560,154
11 4,560,155
18 4,560,156
126 4,560,157
165 4,560,158
263 4,560,159

CLASS 272

133 4,560,160

CLASS 273

63 B 4,560,162
73 C B1 3,999,756
85 CP 4,560,161
85 R 4,560,163
155 4,560,164
157 R 4,561,097
183 A 4,560,165
183 B 4,560,166
184 A 4,560,167
232 4,560,168
242 4,560,169
248 4,560,170
269 4,560,171

CLASS 277

3 4,560,172
15 4,560,173
92 4,560,174
4,560,175
105 4,560,176
134 4,560,177
212 FB 4,560,178

CLASS 279

15 4,560,179

CLASS 280

33.99 B 4,560,180
242 WC 4,560,181
257 4,560,182
477 4,560,183
478 B 4,560,184
748 4,560,185
752 4,560,186
804 4,560,187

CLASS 285

47 4,560,188
158 4,560,189

CLASS 290

42 4,560,884

CLASS 292

111 4,560,190
264 4,560,191
339 4,560,192

CLASS 294

31.2 4,560,193
61 4,560,194

CLASS 296

1 S 4,560,195
95 C 4,560,245
102 4,560,196
155 4,560,197
185 4,560,198

CLASS 297

323 4,560,199
346 4,560,200
393 4,560,201
410 4,560,202
481 4,560,203
483 4,560,204

CLASS 299

2 4,560,205
4,560,206
10 4,560,207

CLASS 303

6 C 4,560,208
22 R 4,560,209
4,560,210

CLASS 305

35 EB 4,560,211

CLASS 307

10 R 4,560,885
64 4,560,886
66 4,560,887
272 A 4,560,888
290 4,560,889
355 4,560,890
597 4,560,891
4,560,892

CLASS 308

3.8 4,560,212
5 R 4,560,213

CLASS 310

43 4,560,893
67 R 4,560,894
77 4,560,895
215 4,560,896

CLASS 312

114 4,560,214
196 4,560,215

CLASS 313

337 4,560,897
400 4,560,898
449 4,560,899
479 4,560,900
499 4,560,901
502 4,560,902
625 4,560,903

CLASS 315

3.5 4,560,904
5.41 4,560,905
47 4,560,906
111.01 4,560,907
219 4,560,908
291 4,560,909
382 4,560,910

CLASS 318

135 4,560,911
480 4,560,912
760 4,560,913

CLASS 320

1 4,560,914
35 4,560,915

CLASS 322

86 4,560,916

CLASS 323

210 4,560,917
273 4,560,918
314 4,560,919
315 4,560,920
316 4,560,921

CLASS 324

52 4,560,922
61 QL 4,560,923
61 R 4,560,924
97 4,560,925
158 P 4,560,926
166 4,560,927
172 4,560,928
207 4,560,929
4,560,930
220 4,560,931
244 4,560,932
319 4,560,933
323 4,560,934
326 4,560,935
418 4,560,936
433 4,560,937

CLASS 328

71 4,560,938
72 4,560,939
150 4,560,940

CLASS 329

50 4,560,941
101 4,560,942
103 4,560,943

CLASS 330

10 4,560,944
149 4,560,945
4,560,946
254 4,560,947
282 4,560,948
284 4,560,949

CLASS 331

1 A 4,560,950
107 A 4,560,951
107 DP 4,560,952
108 B 4,560,954
108 D 4,560,953
116 R 4,560,955
4,560,956
135 4,560,957
4,560,958
176 4,560,959
178 4,560,960

CLASS 332

23 A 4,560,961

CLASS 333

1 4,560,962
172 4,560,963
202 4,560,964
219 4,560,965

CLASS 335

80 4,560,966
262 4,560,967
272 4,560,969
281 4,560,968

CLASS 336

149 4,560,970

CLASS 337

164 4,560,971
338 4,560,972

CLASS 338

28 4,560,973

CLASS 339

12 V 4,560,216
14 R 4,560,217

17 CF 4,560,218
60 R 4,560,219
74 R 4,560,220
75 MP 4,560,221
4,560,222
95 R 4,560,223
97 C 4,560,224
4,560,225
99 R 4,560,226
147 R 4,560,227
4,560,228
224 4,560,229
4,560,230
258 RR 4,560,231
268 R 4,560,232

CLASS 340

146.2 4,560,974
347 AD 4,560,977
347 CC 4,560,975
347 DD 4,560,976
365 C 4,561,002
539 4,560,978
540 4,560,979
727 4,560,980
747 4,560,981
784 4,560,982
825 4,560,983
825.5 4,560,984
4,560,985
870.38 4,560,986

CLASS 343

17.7 4,560,987

CLASS 346

1.1 4,560,988
4,560,989
17 4,560,990
75 4,560,991
76 PH 4,560,992
4,560,993
108 4,560,994
136 4,560,995
139 R 4,560,996
140 R 4,560,997
4,560,998
160 4,560,999
208 4,561,000
218 4,561,001

CLASS 350

3.7 4,560,233
96.15 4,560,234
96.16 4,560,246
96.24 4,560,235
96.30 4,560,247
96.34 4,560,248
102 4,560,236
162.17 4,560,249
255 4,560,237
266 4,560,238
279 4,560,250
283 4,560,251
315 4,560,252
331 R 4,560,239
336 4,560,240
339 R 4,560,241
425 4,560,242
426 4,560,253
427 4,560,254
469 4,560,243
486 4,560,244
503 4,560,255
613 4,560,256
616 4,560,257

CLASS 351

115 4,560,258
211 4,560,259

CLASS 352

40 4,560,260

CLASS 354

121 4,560,261
180 4,560,262
195.1 4,560,263
219 4,560,264
246 4,560,265
400 4,560,266
412 4,560,267

CLASS 355

3 R 4,560,268

CLASS 356

5 4,560,270
4,560,271
81 4,561,011
138 4,560,272
154 4,560,274
237 4,560,273
246 4,560,269
326 4,560,275
334 4,560,276
357 4,560,277
364 4,560,278
369 4,560,279
375 4,560,280

CLASS 357

23.4 4,561,003
23.5 4,561,004
24 4,561,005
28 4,561,006
30 4,561,007
38 4,561,008
67 4,561,009
74 4,561,010

CLASS 358

11 4,561,012
22 4,561,013
25 4,561,014
44 4,561,015
76 4,561,016
93 4,561,017
107 4,561,018
112 4,561,019
134 4,561,020
158 4,561,021
167 4,561,022
208 4,561,023
287 4,561,024
298 4,561,025
336 4,561,026

CLASS 360

39 4,561,027
77 4,561,028
85 4,561,029
93 4,561,030
96.5 4,561,031
114 4,561,032
130.33 4,561,033
134 4,561,034
137 4,561,035

CLASS 361

20 4,561,036
228 4,561,037
280 4,561,038
328 4,561,039
385 4,561,040
433 4,561,041

CLASS 362

30 4,561,042
32 4,561,043
84 4,561,044
368 4,561,045

CLASS 363

21 4,561,046
56 4,561,047
60 4,561,048

CLASS 364

130 4,561,049
167 4,561,050
200 4,561,051
4,561,052
4,561,053
414 4,561,054
424.1 4,561,055
431.05 4,561,056
436 4,561,057
474 4,561,058
477 4,561,059
478 4,561,060
550 4,561,061
555 4,561,062
559 4,561,063
561 4,561,064
724 4,561,065
736 4,561,066
819 4,561,067
825 4,561,068

CLASS 365

36 4,561,069
227 4,561,070
230 4,561,071
4,561,072

CLASS 366

15 4,560,281
134 4,560,282
188 4,560,283
336 4,560,284
341 4,560,285

CLASS 367

19 4,561,073
46 4,561,074
4,561,075
88 4,561,076

CLASS 368

282 4,561,077

CLASS 369

38 4,561,078
44 4,561,079
45 4,561,080
4,561,081
4,561,082
59 4,561,083
75.2 4,561,084
77.1 4,561,085
100 4,561,086
276 4,561,087

CLASS 370

16 4,561,088
18 4,561,089
60 4,561,090
85 4,561,091
89 4,561,092

CLASS 371

20 4,561,093
24 4,561,094
38 4,561,095

CLASS 372

46 4,561,096

CLASS 374

131 4,560,286
194 4,560,287
201 4,560,288

CLASS 375

49 4,561,098
97 4,561,099
99 4,561,100
108 4,561,101

CLASS 376

121 4,560,528
251 4,560,529
290 4,560,530
302 4,560,531
367 4,560,533
434 4,560,532

CLASS 381

49 4,561,102

CLASS 382

1 4,561,103
8 4,561,104
13 4,561,105
49 4,561,106

CLASS 383

37 4,561,107
63 4,561,108
65 4,561,109
128 4,561,110

CLASS 384

99 4,560,289
434 4,560,290
533 4,560,291

CLASS 400

59 4,560,292
61 4,560,293
145 4,560,294
208 Re.32,053
637.1 4,560,295
649 4,560,296

CLASS 401

31 4,560,297
107 4,560,298

CLASS 402

15 4,560,299

CLASS 403

11 4,560,300
232.1 4,560,301

CLASS 404

4 4,560,302
118 4,560,303

CLASS 405

74 4,560,304
76 Re.32,054
259 4,560,305
295 4,560,306

CLASS 406

63 4,560,307

CLASS 407

53 4,560,308

CLASS 408

229 4,560,309

CLASS 409

233 4,560,310

CLASS 411

44 4,560,311
55 4,560,312

CLASS 413

1 4,560,313

CLASS 414

276 4,560,314
401 4,560,315
481 4,560,316
672 4,560,317
724 4,560,318

CLASS 415

1 4,560,319
118 4,560,320

CLASS 416

23 4,560,321

CLASS 417

26 4,560,322
27 4,560,323
383 4,560,324
407 4,560,325
480 4,560,326
493 4,560,327

CLASS 418

1 Re.32,055
8 4,560,328
47 4,560,329
55 4,560,330
65 4,560,331
83 4,560,332
180 4,560,333

CLASS 422

68 4,560,534
102 4,560,535
116 4,560,536
190 4,560,537

CLASS 423

3 4,560,538
59 4,560,539
116 4,560,540
126 4,560,541
242 4,560,543
266 4,560,544
328 4,560,542
430 4,560,545
607 4,560,546
650 4,560,547

CLASS 424

1.1 4,560,548
18 4,560,549
71 4,560,554
78 4,560,553
4,560,555
84 4,560,551
101 4,560,556
114 4,560,550
4,560,552

CLASS 425

4 C 4,560,334
62 4,560,335
78 4,560,336
288 4,560,337
308 4,560,338
437 4,560,339
526 4,560,340
532 4,560,341
562 4,560,342

CLASS 426

19 4,560,559
38 4,560,560
74 4,560,561
87 4,560,562
101 4,560,563
250 4,560,564
330.4 4,560,565
399 4,560,566
4,560,567
417 4,560,568
549 4,560,569
564 4,560,570
594 4,560,571
616 4,560,572
622 4,560,573
649 4,560,574

CLASS 427

6 4,560,575
38 4,560,576
4,560,577
44 4,560,578
45.1 4,560,579
53.1 4,560,580
64 4,560,581
88 4,560,582
4,560,583
96 4,560,584
103 4,560,585
134 4,560,586
152 4,560,587
215 4,560,588
249 4,560,589
294 4,560,590
422 4,560,591
430.1 4,560,592
443.1 4,560,593

CLASS 428

1 4,560,594
17 4,560,595
31 4,560,596
4,560,597
35 4,560,598
36 4,560,599
43 4,560,600
64 4,560,601
79 4,560,602
86 4,560,603
87 4,560,604
141 4,560,606
4,560,607
196 4,560,608
220 4,560,609
246 4,560,610
266 4,560,611
288 4,560,612
309.9 4,560,613
317.9 4,560,614
328 4,560,615
423.1 4,560,616
4,560,617
500 4,560,618
541 4,560,619
565 4,560,620
566 4,560,621
599 4,560,622
626 4,560,623
632 4,560,624
654 4,560,625

CLASS 429

27 4,560,626
103 4,560,627
105 4,560,628
184 4,560,629
194 4,560,630
4,560,631
196 4,560,632
213 4,560,633

CLASS 430

84 4,560,634
106.6 4,560,635
165 4,560,636
202 4,560,637
264 4,560,638
273 4,560,639
280 4,560,640
312 4,560,641
313 4,560,642
346 4,560,643
351 4,560,644
562 4,560,645
566 4,560,646

CLASS 431

66 4,560,343
253 4,560,344
344 4,560,345

CLASS 432

24 4,560,346
59 4,560,347
77 4,560,348
223 4,560,349
241 4,560,350

CLASS 433

80 4,560,351
90 4,560,352
173 4,560,353

CLASS 434

208 4,560,354

CLASS 435

5 4,560,647
7 4,560,648
4,560,649
15 4,560,650
95 4,560,651
108 4,560,652
109 4,560,653
115 4,560,654
123 4,560,657
146 4,560,656
160 4,560,658
162 4,560,659
176 4,560,660
183 4,560,661
241 4,560,655
253 4,560,662

CLASS 436

25 4,560,663
29 4,560,664
172 4,560,665

CLASS 440

86 4,560,355

CLASS 441

80 4,560,356

CLASS 445

26 4,560,357

CLASS 446

46 4,560,358
75 4,560,359
186 4,560,392
222 4,560,360
231 4,560,361
340 4,560,362
342 4,560,363

CLASS 455

63 4,561,111
166 4,561,112
205 4,561,113
226 4,561,114
228 4,561,115
603 4,561,116
608 4,561,117
4,561,118
609 4,561,119
612 4,561,120

CLASS 464

30 4,560,364
52 4,560,365
68 4,560,366
83 4,560,367
112 4,560,368

CLASS 474

28 4,560,369
201 4,560,370
4,560,371

CLASS 501

5 4,560,666
40 4,560,667
92 4,560,668
97 4,560,669

CLASS 502

26 4,560,670
105 4,560,671
183 4,560,672
206 4,560,673
209 4,560,674
407 4,560,675

CLASS 514

12 4,560,676
30 4,560,677
44 4,560,678
63 4,560,679
82 4,560,680
4,560,681
100 4,560,682
178 4,560,557
202 4,560,683
221 4,560,684
222 4,560,685
242 4,560,687
243 4,560,688
250 4,560,689
255 4,560,686
256 4,560,690
300 4,560,691
313 4,560,692
338 4,560,693
359 4,560,694
372 4,560,695
379 4,560,558
383 4,560,697
397 4,560,696
413 4,560,699
423 4,560,700
443 4,560,701
469 4,560,698
493 4,560,702
530 4,560,703

CLASS 521

31 4,560,704
60 4,560,705
85 4,560,706
124 4,560,707
137 4,560,708

CLASS 523

175 4,560,710
212 4,560,711
220 4,560,712
400 4,560,713
409 4,560,714
443 4,560,715
451 4,560,716
456 4,560,717

CLASS 524

13 4,560,718
269 4,560,719
288 4,560,720
378 4,560,721

CLASSIFICATION OF PATENTS

405	4,560,722
486	4,560,723
734	4,560,724
CLASS 525	
67	4,560,725
71	4,560,726
95	4,560,727
123	4,560,728
233	4,560,729
340	4,560,730
344	4,560,731
481	4,560,732
CLASS 526	
129	4,560,733
142	4,560,734
232.3	4,560,735
312	4,560,736
CLASS 527	
72	4,560,737
CLASS 528	
62	4,560,738
99	4,560,739
125	4,560,740
302	4,560,741
342	4,560,742
348	4,560,743
CLASS 534	
696	4,560,744
728	4,560,745
840	4,560,746
887	4,560,747
CLASS 536	
24	4,560,748
CLASS 544	
16	4,560,749
21	4,560,750
60	4,560,751
66	4,560,752
279	4,560,753
282	4,560,754
363	4,560,755
408	4,560,756
CLASS 546	
112	4,560,757
121	4,560,758
178	4,560,759
243	4,560,760
283	4,560,761
297	4,560,762
341	4,560,763
CLASS 548	
190	4,560,764
194	4,560,765
311	4,560,766
435	4,560,768
560	4,560,769
561	4,560,770
578	4,560,767
CLASS 549	
15	4,560,771
240	4,560,772
	4,560,773
267	4,560,774
326	4,560,775
356	4,560,776
374	4,560,777
455	4,560,778
510	4,560,779
CLASS 556	
40	4,560,780
137	4,560,781
	4,560,782
183	4,560,783
401	4,560,784
CLASS 560	
52	4,560,785
	4,560,787
55	4,560,786
91	4,560,788
142	4,560,789
210	4,560,790
254	4,560,791
261	4,560,792
CLASS 562	
414	4,560,793
467	4,560,794
561	4,560,795
CLASS 564	
104	4,560,796
267	4,560,797
503	4,560,798
CLASS 568	
47	4,560,799
306	4,560,800
362	4,560,801
388	4,560,802
401	4,560,803
408	4,560,804
	4,560,805
462	4,560,806
698	4,560,807
722	4,560,808
789	4,560,809
805	4,560,810
848	4,560,811
869	4,560,812
872	4,560,813
CLASS 570	
144	4,560,814
CLASS 585	
259	4,560,815
266	4,560,816
273	4,560,817
443	4,560,818
445	4,560,819
489	4,560,820
500	4,560,821
606	4,560,822
654	4,560,823
662	4,560,824
724	4,560,825
CLASS 604	
9	4,560,375
30	4,560,373
49	4,560,374
54	4,560,376
68	4,560,377
83	4,560,378
368	4,560,379
369	4,560,372
385 R	4,560,380
396	4,560,381
408	4,560,382
CLASS 623	
3	4,559,648

CLASSIFICATION OF DESIGNS

D2—	28	281,828
	309	281,829
	400	281,830
D3—	23	281,831
	30.1	281,832
	31	281,833
	35	281,834
	74	281,835
		281,836
		281,837
D6—	323	281,838
	335	281,839
	366	281,840
	404	281,841
	419	281,842
	449	281,843
	472	281,844
	522	281,845
D7—	9	281,846
		281,847
		281,848
	27	281,849
	46	281,850
	301	281,851
D8—	13	281,852
	23	281,853
	24	281,854
	42	281,855
	72	281,856
	101	281,857
	352	281,858
	367	281,859
	382	281,860
D9—	377	281,861
	385	281,862
	389	281,863
D10—	80	281,864
	106	281,865
		281,866
D11—	98	281,867
	158	281,868
	164	281,869
D12—	110	281,870
	114	281,871
	169	281,872
	172	281,873
	180	281,874
	182	281,875
D13—	24	281,876
D14—	6	281,877
	57	281,878
	70	281,879
	81	281,880
D15—	33	281,881
	90	281,882
	91	281,883
	199	281,884
D16—	102	281,885
D18—	7	281,886
D19—	39	281,887
D21—	13	281,888
	59	281,889
	174	281,890
	210	281,891
	244	281,892
	245	281,893
D22—	7	281,894
		281,895
	13	281,896
	27	281,897
	28	281,898
D23—	18	281,899
		281,900
	138.3	281,901
D24—	8	281,902
	21	281,903
	33	281,904
	64	281,905
	99	281,906
		281,907
D25—	80	281,908
D26—	11	281,909
		281,910
		281,911
	28	281,912
D28—	83	281,913
		281,914
		281,915
	99	281,916
D30—	3	281,917
D32—	14	281,918
	21	281,919
D99—	28	281,920
		281,921
		281,922
	37	281,923

CLASSIFICATION OF PLANTS

P.—	5	5,606
	18	5,607
	20	5,608
	38	5,609
		5,610
	68	5,611
		5,612
		5,613

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,560,160	4,560,032	4,560,752	4,560,272	4,560,034	4,560,039
04 : 4,559,653	4,560,064	4,560,779	4,560,427	4,560,062	4,560,048
4,559,708	4,560,088	4,560,820	4,560,566	4,560,076	4,560,274
4,560,084	4,560,092	4,560,829	4,560,690	4,560,080	4,560,351
4,560,121	4,560,124	4,560,832	4,560,859	4,560,095	4,560,361
4,560,215	4,560,128	4,560,838	4,560,968	4,560,102	4,560,368
4,560,244	4,560,151	4,560,874	4,560,970	4,560,127	4,560,484
4,560,245	4,560,162	4,560,878	4,561,093	4,560,140	4,560,509
4,560,380	4,560,164	4,560,881	10 : 4,560,196	4,560,148	4,560,695
4,560,381	4,560,165	4,560,882	4,560,340	4,560,152	4,560,704
4,560,436	4,560,175	4,560,921	11 : 4,560,170	4,560,168	4,560,718
4,560,541	4,560,180	4,560,923	4,560,559	4,560,177	4,560,722
4,560,774	4,560,181	4,560,925	4,561,117	4,560,207	4,560,749
4,560,987	4,560,212	4,560,934	12 : 4,559,658	4,560,222	4,560,808
4,561,053	4,560,234	4,560,962	4,559,671	4,560,227	4,560,837
05 : 4,559,961	4,560,256	4,560,967	4,559,690	4,560,348	4,560,853
4,560,074	4,560,259	4,560,974	4,559,700	4,560,365	19 : 4,559,832
06 : 4,559,649	4,560,260	4,560,983	4,559,856	4,560,376	4,559,847
4,559,660	4,560,275	4,560,994	4,559,878	4,560,409	4,559,905
4,559,669	4,560,286	4,561,017	4,559,941	4,560,444	4,559,965
4,559,670	4,560,301	4,561,028	4,560,033	4,560,469	4,560,949
4,559,679	4,560,304	4,561,035	4,560,077	4,560,472	4,561,055
4,559,696	4,560,358	4,561,043	4,560,120	4,560,494	20 : 4,559,805
4,559,705	4,560,359	4,561,066	4,560,146	4,560,504	4,559,867
4,559,711	4,560,362	4,561,070	4,560,229	4,560,519	4,560,131
4,559,713	4,560,363	4,561,095	4,560,318	4,560,533	4,560,884
4,559,734	4,560,364	4,561,105	4,560,354	4,560,547	21 : 4,560,396
4,559,737	4,560,374	08 : 4,559,801	4,560,356	4,560,558	4,560,714
4,559,748	4,560,375	4,559,836	4,560,391	4,560,658	4,560,956
4,559,787	4,560,378	4,559,943	4,560,650	4,560,675	4,561,002
4,559,796	4,560,383	4,559,988	4,560,935	4,560,728	22 : 4,559,809
4,559,797	4,560,393	4,560,060	4,560,938	4,560,754	4,559,970
4,559,810	4,560,394	4,560,125	4,560,948	4,560,761	4,560,078
4,559,818	4,560,417	4,560,201	13 : 4,559,729	4,560,831	4,560,139
4,559,835	4,560,425	4,560,205	4,559,960	4,560,846	4,560,491
4,559,875	4,560,443	4,560,206	4,559,979	4,560,870	4,560,542
4,559,891	4,560,459	4,560,307	4,561,089	4,560,876	23 : 4,560,578
4,559,893	4,560,465	4,560,335	17 : Re.32,056	4,560,910	24 : 4,559,717
4,559,894	4,560,470	4,560,419	4,559,677	4,560,915	4,559,761
4,559,897	4,560,473	4,560,517	4,559,760	4,560,971	4,559,765
4,559,903	4,560,498	4,560,834	4,559,769	4,561,046	4,559,822
4,559,911	4,560,515	4,560,871	4,559,817	4,561,090	4,559,931
4,559,926	4,560,528	4,560,873	4,559,823	4,561,102	4,559,946
4,559,927	4,560,561	4,560,986	4,559,827	4,561,108	4,560,100
4,559,939	4,560,572	09 : Re.32,053	4,559,841	18 : 4,559,655	4,560,147
4,559,947	4,560,585	4,559,735	4,559,873	4,559,656	4,560,169
4,559,957	4,560,600	4,559,825	4,559,900	4,559,781	4,560,395
4,559,974	4,560,621	4,559,862	4,559,908	4,559,782	4,560,653
4,559,975	4,560,626	4,559,949	4,559,955	4,559,802	4,560,945
4,559,999	4,560,648	4,560,050	4,559,971	4,559,834	3,999,756
4,560,009	4,560,663	4,560,132	4,559,997	4,559,858	25 : 4,559,676
4,560,014	4,560,664	4,560,156	4,560,018	4,559,995	4,559,722
4,560,016	4,560,699	4,560,190	4,560,019	4,560,037	4,559,795

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